

ACHIEVING SUSTAINABILITY IS A JOURNEY: AN ANALYSIS OF INTERNAL PRACTICES AND IMPLICATIONS FOR SME CONSTRUCTION CONTRACTORS

Joshua Emmons¹, Mohan Siriwardena², Chamari Allis³ and Anupa Manewa²

ABSTRACT

Small and medium sized enterprises (SMEs) constitute the majority of the UK construction sector yet remain among the least equipped to adopt sustainable practices. Limited financial resources, competing operational priorities, and the perceived complexity of regulatory and voluntary frameworks, including Building Regulations Part L, BREEAM, and ISO 14001, create compounding barriers that constrain meaningful sustainability integration. Understanding the internal factors shaping SME sustainability adoption is therefore critical to accelerating industry-wide progress toward net-zero construction. This paper examines the internal barriers, motivations, and cost implications of sustainability adoption among private-sector construction SMEs in North Wales and Northwest England, two regions with distinct but underexplored policy environments. A qualitative, interpretivist research design was employed, comprising eleven semi-structured interviews with key decision-makers across SME contractor firms. Data were analysed using Braun and Clarke's (2006) six-phase reflexive thematic analysis, interpreted through the lens of institutional isomorphism. Findings reveal that sustainability adoption is predominantly reactive and client-driven, with lowest-price tendering cultures systematically suppressing sustainable procurement decisions. Staff resistance and an office to site knowledge gap represent the most significant internal barriers, while grant and incentive mechanisms are widely characterised as inaccessible and administratively disproportionate. Leadership disposition emerged as a critical moderating factor, with values-driven directors demonstrating more advanced practices than compliance-oriented peers. The paper recommends that SMEs pursue incremental adoption strategies supported by visible leadership commitment and targeted site level training. It also highlights the need for SME-proportionate compliance frameworks, simplified financial mechanisms, and proactive lifecycle cost advisory services to better align policy ambition with SME delivery capacity..

Keywords: *Construction; North Wales; Northwest England; SMEs; Sustainability.*

¹ Alumnus, School of Engineering and Built Environment Department, Liverpool John Moores University, United Kingdom, Emmons01@gmail.com

² Senior Lecturer, School of Engineering and Built Environment, Liverpool John Moores University, United Kingdom, m.l.siriwardena@ljmu.ac.uk

³ Senior Teaching Fellow, School of Engineering and Built Environment Department, Liverpool John Moores University, United Kingdom, cbecperi@ljmu.ac.uk

1.0 INTRODUCTION

The construction industry remains one of the most resource intensive sectors globally, accounting for approximately 40% of worldwide energy consumption and a significant proportion of carbon emissions (Kibert, 2016). Within this context, small and medium sized enterprises (SMEs) represent the backbone of the United Kingdom (UK) construction sector, yet their internal sustainability practices remain critically underexplored in the academic literature. While substantial research has examined external drivers of sustainability adoption (i.e. regulatory frameworks, client demands, and procurement requirements) comparatively little attention has been directed toward what happens inside these organisations for instance how leaders interpret sustainability mandates, how costs are priced into tenders, and how day to day decisions either embed or obstruct sustainable practice (Hashim et al., 2022; Lindblad & Gustavsson, 2021).

SMEs face a distinctly different operational reality from their larger counterparts. Limited financial resources constrained in house expertise, and the absence of dedicated sustainability functions create compounding barriers to meaningful adoption (Revell & Blackburn, 2007; Häkkinen & Belloni, 2011). Although benefits such as cost savings, reputational gains, and regulatory compliance are widely cited as motivators, recognition of these benefits remains uneven, particularly among the smallest firms operating in regional markets (Brammer et al., 2012).

This paper focuses on private sector construction SMEs operating across North Wales and Northwest England, two regions that present a compelling and underexplored research context. Both regions are subject to distinct legislative and policy landscapes that elevate sustainability expectations beyond baseline UK requirements. In Wales, the Well-being of Future Generations (Wales) Act 2015 embeds long term sustainability obligations across public life, while across both regions, Procurement Policy Note 06/21 (Cabinet Office, 2021) requires Carbon Reduction Plans from suppliers on major public contracts. The Building Regulations 2010 Part L sets statutory minimum energy performance standards, and voluntary frameworks such as BREEAM and ISO 14001 increasingly feature in client and procurement requirements (DLUHC, 2023). Despite this dense regulatory environment, the degree to which private-sector SMEs internalise and operationalise these expectations in their tendering, procurement, and on-site practices remains poorly understood.

SMEs are distinct from larger construction firms in three critical respects that justify dedicated empirical attention. First, their operational constraints such as limited financial reserves, absence of dedicated sustainability functions, and thin operating margins, mean that the costs and processes of sustainability adoption are fundamentally different from those faced by large contractors (Revell & Blackburn, 2007; Häkkinen & Belloni, 2011). Second, regulatory pressure reaches SMEs indirectly, through supply chain obligations rather than direct mandate, creating an uneven and under-researched compliance dynamic (Walker et al., 2008; Brammer et al., 2012). The practical gap is the absence of SME-tailored, regionally

specific guidance for policymakers and quantity surveying professionals seeking to embed sustainability in private-sector project delivery.

This paper addresses that gap by examining the internal barriers, motivations, and cost implications that shape sustainability adoption among construction SMEs in these two regions. The analysis centres on five dimensions such as current sustainability practices, financial considerations, internal barriers, regulatory and framework compliance (Building Regulations Part L, and voluntary sustainability frameworks including BREEAM and ISO 14001), and practical recommendations for the SME sector.

The study is guided by the following objectives: to identify the current sustainability practices adopted by construction SMEs in the study regions; to analyse the financial barriers and cost implications that constrain or enable sustainability adoption; to investigate the internal organisational factors including leadership disposition, staff capability, and knowledge distribution that moderate sustainability implementation and to assess how external regulatory and voluntary frameworks (BREEAM, ISO 14001, PPN 06/21) are experienced and interpreted by SME practitioners. The contribution of this study can be articulated as two novel contributions. First, theoretically, the study extends the application of institutional isomorphism to the level of internal firm-level decision-making in SMEs, demonstrating how mimetic copying without capability development produces performative compliance, a pattern distinct from that documented in large-firm studies. Second, professionally, it foregrounds the Quantity Surveyor (QS) as an active sustainability enabler rather than a passive cost recorder, a contribution with direct relevance to QS professional development and practice standards (Kannan & Gambetta, 2025; Jamil et al., 2025).

2.0 SUSTAINABILITY IN CONSTRUCTION

The construction industry's transition toward sustainability is shaped by three converging forces namely regulatory mandate, market expectation, and corporate responsibility (Darko et al., 2017). In the UK, statutory instruments such as Building Regulations Part L establish minimum energy performance thresholds (HM Government, 2023), while voluntary frameworks including BREEAM and ISO 14001 have become actual benchmarks for environmental performance across both public and private procurement (BRE Global, 2025; ISO, 2015). At the governance level, Environmental, Social, and Governance (ESG) compliance is an accelerating priority, with supply chain requirements, most notably Procurement Policy Note 06/21 (Cabinet Office, 2021), extending sustainability obligations downstream to subcontractors and SME suppliers.

DiMaggio and Powell's (1983) institutional isomorphism theory provides a useful explanatory lens whereby firms conform to industry norms through coercive pressure (regulation), mimetic pressure (industry benchmarking), and normative pressure (professional standards). Larger firms, operating under greater public accountability and regulatory scrutiny, are more able to respond to these pressures proactively, aligning with green certifications, accessing sustainability linked finance, and embedding sustainability within corporate governance frameworks (Chassé & Boiral, 2017; Garay & Font, 2022). For SMEs,

however, this institutional pressure frequently arrives without the resources necessary to respond meaningfully.

3.0 INDUSTRY-WIDE SUSTAINABILITY TRENDS

SMEs constitute the majority of construction sector enterprises in the UK, yet they face a fundamentally different sustainability reality from their larger counterparts. Financial constraints, limited in house expertise, and restricted access to green finance create compounding barriers to adoption (Revell & Blackburn, 2007; Häkkinen & Belloni, 2011). While lifecycle costing demonstrates that sustainable practices can reduce long-term running and maintenance costs (Flanagan & Jewell, 2008), SMEs are characterised in the literature as prioritising short-term affordability over long-term value, a rational response to tight operating margins and cash flow sensitivity (Chen et al., 2024). Bocken and Short (2021) argued that many SMEs operate within fundamentally unsustainable business models, where sustainability is framed as an additional cost rather than a strategic lever.

The skills dimension compounds this challenge significantly. Maqbool et al. (2024) documented a severe and worsening skills shortage across UK construction, with the industry projected to require approximately 251,500 additional workers by 2028 (CITB, 2024). For SMEs, this shortage is particularly acute: without access to dedicated sustainability professionals or the financial capacity to engage external consultants, smaller firms lack the internal knowledge to design, implement, and document sustainable practices effectively (Häkkinen & Belloni, 2011; Dolšák et al., 2024). Durrani et al. (2024) identify awareness, knowledge, and skills deficits as among the most significant barriers to SME environmental practice, consistent with evidence that firms with stronger green competencies progress further on resource efficiency and circular economy measures (Bassi & Guidolin, 2021).

3.1 Financial Barriers and the Cost Implications of Sustainability

The financial case for sustainability adoption among SMEs is complex and contested. On the one hand, cost savings from energy efficiency, waste minimisation, and circular economy practices including material reuse, just-in-time delivery, and off-site prefabrication are widely reported as tangible motivators (Darko et al., 2017; Hwang & Tan, 2012; Ajayi et al., 2015). On the other hand, the upfront capital investment required for sustainable materials, renewable energy systems, and certification processes frequently deters investment among cash-constrained SMEs (Häkkinen & Belloni, 2011; Revell & Blackburn, 2007).

Access to green finance and sustainability linked investment is growing, with some lenders offering reduced interest margins contingent on ESG KPI achievement (Kim et al., 2021). However, preferential lending terms remain more accessible to larger firms with stronger credit profiles, and many SMEs lack awareness of available instruments (Chen et al., 2024; Johnson, 2015). Government incentive schemes exist but are widely characterised as fragmented, administratively burdensome, and poorly tailored to SME operational realities, many local grant schemes, for instance, require upfront cash-flowing before reimbursement, a significant barrier for smaller firms (Rizos et al., 2016; Bristol City Council, 2024). The

Enterprise Research Centre (2023) found that recipients of net-zero support represent less than 1% of the total UK SME population, underscoring the limited reach of current provision.

3.2 Governance, Compliance, and Regulatory Complexity

SMEs operating in public sector supply chains are increasingly subject to sustainability compliance requirements embedded in procurement frameworks, including carbon footprint reporting, waste management documentation, and structured audit processes under PPN 06/21 (Cabinet Office, 2021; Walker et al., 2008). Failure to meet these requirements risks exclusion from preferred-supplier lists and loss of pipeline visibility. Conversely, proactive adoption of standards such as ISO 14001 is associated with measurable competitive advantages, including bid differentiation and improved employee recruitment and retention (Tari et al., 2012; John et al., 2023).

Despite these incentives, policy guidance for construction SMEs is rarely tailored to their operational context. The OECD (2021) argues that one size fits all regulatory approaches are ill-suited to a heterogeneous SME base and calls for SME specific regulatory design that accounts for their limited administrative capacity. This is particularly relevant in the regional context of this study: the Well-being of Future Generations (Wales) Act 2015 and devolved procurement frameworks in Wales introduce additional sustainability obligations that private-sector SMEs must navigate alongside UK wide requirements, yet evidence on how these regional frameworks affect SME-level decision-making remains limited (Welsh Government, 2015).

The role of the QS is increasingly relevant to SME sustainability adoption. As the primary cost advisor on construction projects, the QS is uniquely positioned to translate lifecycle costing evidence into commercially viable tender strategies, model the long-term financial returns of sustainable design decisions against short-term capital premiums, and navigate green finance mechanisms on behalf of SME clients (Flanagan & Jewell, 2008; Wao et al., 2016). In a sector where sustainability is routinely framed as an additional cost rather than a quantified investment, QS professionals can reframe the commercial conversation, introducing sustainability KPIs into private-sector procurement where no regulatory obligation currently exists, and identifying incentive schemes that reduce the net cost burden for cash-constrained firms. This advisory role is particularly pertinent in the SME context, where in-house sustainability expertise is absent and commercial decision-making is concentrated among a small number of directors and project managers.

4.0 RESEARCH GAPS AND THEORETICAL POSITIONING

The existing literature, while substantial on external drivers and large-firm sustainability strategies, contains three critical gaps relevant to this study. First, firm-level, internal decision-making processes, how SME leaders interpret, price, and act on sustainability mandates in tendering, procurement, and on-site practice, remain underexplored (Hwang & Tan, 2012; Hashim et al., 2022). Second, regional variation in SME sustainability adoption, particularly across North Wales and Northwest England, has received insufficient empirical attention, despite meaningful differences in policy environments and support mechanisms.

Third, the role of digital tools, specifically BIM, in enabling cost-effective sustainability adoption among SMEs remains nascent; while barriers to BIM adoption are documented (Chmeit et al., 2024; Seidu et al., 2022), the practical sustainability returns for smaller firms are not yet well evidenced.

These gaps motivate the empirical focus of this study: examining the internal barriers, motivations, and cost implications of sustainability adoption among private-sector construction SMEs in North Wales and Northwest England, with specific attention to how firm-level factors interact with external regulatory and market pressures.

5.0 RESEARCH METHODOLOGY

5.1 Research Design and Philosophy

This study adopts a qualitative research design grounded in an interpretivist philosophical stance. Interpretivism is appropriate here because the research seeks to understand how SME construction professionals perceive, experience, and respond to sustainability, a phenomenon shaped by individual judgement, organisational context, and professional culture rather than objective, measurable conditions (Ramanathan, 2008; Ryan, 2018). Accordingly, the design prioritises depth and contextual meaning over statistical generalisation, with institutional isomorphism (DiMaggio & Powell, 1983) employed as a theoretical framework to interpret how SMEs respond to coercive, mimetic, and normative sustainability pressures.

5.2 Data Collection

Semi structured interviews were selected as the primary data collection method. This approach provides the flexibility to explore predefined themes, financial constraints, internal barriers, sustainability motivations, and regulatory compliance, while allowing participants to introduce contextually relevant issues not anticipated in the interview guide (Thompson, 2014). This flexibility is particularly important given the diverse operational structures and decision-making cultures found across SMEs of different sizes and specialisms.

Purposive sampling was employed to recruit participants with direct decision-making authority over sustainability-related matters within their organisations. The target population comprised construction contractors operating in North Wales and Northwest England, classified as SMEs under UK definitions (fewer than 250 employees; annual turnover not exceeding £50 million). Participant roles included directors, project and contracts managers, site managers, procurement managers, and quantity surveyors, ensuring data reflected both strategic and operational perspectives. These two regions were specifically selected due to their distinct policy environments: Wales operates under the Wellbeing of Future Generations (Wales) Act 2015, which embeds long-term sustainability obligations that indirectly shape procurement expectations for private-sector SMEs, while both regions are subject to PPN 06/21 (Cabinet Office, 2021) requirements.

Specifically, participants were required to meet three criteria such as direct decision-making authority over tendering, procurement, sustainability commitments, or site operations, employment within an SME as defined by UK criteria and operations based in North Wales

or Northwest England. Recruitment continued until data saturation was approached, evidenced by recurrence of themes across the final three interviews without substantively new codes emerging. The eleven participants collectively represented strategic (director, commercial manager, contracts manager) and operational (site manager, QS, project manager) perspectives, ensuring coverage of both policy-level sustainability commitments and their on-the-ground translation into site practice.

Interviews were conducted either in-person or via remote platforms (Zoom or Microsoft Teams), each lasting between 15 and 25 minutes. All sessions were audio-recorded with explicit informed consent. Transcripts were anonymised in compliance with GDPR and institutional ethical guidelines (Ethics Reference: 24/HITS/309).

5.3 Data Analysis

Interview data was analysed using Braun and Clarke's (2006) six-phase thematic analysis procedure:

- Phase 1: Familiarisation with data: Reading and re-reading the interview transcripts to become deeply acquainted with the content
- Phase 2: Generation of initial codes: Systematic coding/sorting of interesting features across the entire data set, capturing relevant concepts and recurring issues
- Phase 3: Construction of themes: Collating codes into potential themes that aligned with the research objectives, such as financial barriers, sustainability drivers, regulatory compliance, and organisational capacity
- Phase 4: Theme review: Evaluating and refining themes to ensure they accurately represented the data and were (or were not) consistent across the data set
- Phase 5: Theme definition: Clearly articulating the scope and content of each theme and identifying any subthemes
- Phase 6: Report production: Synthesising the findings into a comprehensive narrative, integrating insights from both the primary data and the existing literature.

This approach is well suited to the research question as it foregrounds context and meaning, enabling patterns to emerge across participants rather than relying on frequency counts alone. Codes were derived inductively from the transcripts, with early-stage memos capturing emerging links between cost perceptions, organisational capability, and compliance behaviour. Themes were subsequently reviewed against the full dataset for coherence and consistency, with isolated but analytically significant cases retained where they illuminated processes underreported in the literature.

To strengthen the trustworthiness and credibility of the analysis, several procedural safeguards were employed (Lincoln & Guba, 1985). An independent coding pass was conducted prior to theme consolidation, with codes reviewed against the full dataset to ensure

coherence and fit. Reflexive memos were maintained throughout to surface and interrogate the researcher's interpretive assumptions. Together, these measures provide a transparent audit trail from raw data to thematic conclusions, consistent with Lincoln and Guba's (1985) credibility and dependability criteria.

Institutional isomorphism (DiMaggio & Powell, 1983) informed the coding framework throughout, providing a systematic lens through which regulatory, competitive, and normative pressures on SMEs could be interpreted and compared across participants.

5.4 Researcher Positionality and Credibility

The researcher is a practising quantity surveyor within a private-sector SME, which provided privileged access to participants and strong contextual understanding of how tendering margins and programme pressures shape sustainability decisions. To mitigate the risk of a cost-first interpretive bias, non-leading interview questions were used throughout, and both common and contrary participant perspectives were purposefully represented in the analysis. Triangulation across literature, interview data, and thematic patterns was employed to enhance the credibility and trustworthiness of the findings (Parahoo, 2006). Approval was obtained from Liverpool John Moores University's research ethics committee for this research study.

Further steps were taken to ensure analytical rigour. Interview questions were designed to be non-leading and reviewed against established guidelines for semi-structured qualitative interviews (Saunders et al., 2023). Reflexive memos were maintained throughout data collection and analysis, with interpretive decisions documented and revisited as themes developed. Participant perspectives that challenged the dominant cost-first narrative (including the values-driven cases of P9 and P11) were purposefully foregrounded rather than treated as peripheral. The breadth of roles and firm types represented in the sample provides respondent diversity that further mitigates the risk of researcher-imposed framing (Berger, 2013; Krumpal, 2013).

6.0 FINDINGS AND ANALYSIS

6.1 Participant Profile

Eleven semi structured interviews were conducted with SME construction professionals operating across North Wales and Northwest England. Participants represented a range of roles spanning strategic and operational levels, providing both management level and site level perspectives on sustainability adoption (Table 1).

Table 1: Participant Profiles

Participant	Role	Company Type
P1	Contracts Manager	Regional Contractor (SME)
P2	Director	Regional Contractor (SME)
P3	Quantity Surveyor	Regional Contractor (SME)
P4	Site Manager	Regional Contractor (SME)

P5	Commercial Manager	Regional Contractor (SME)
P6	Director	Regional Contractor (SME)
P7	Project Manager/Programmer	Regional Contractor (SME)
P8	Quantity Surveyor	Regional Contractor (SME)
P9	Director	Regional Contractor (SME)
P10	Director	Regional Contractor (SME)
P11	Director	Regional Contractor (SME)

Thematic analysis following Braun and Clarke (2006) produced four overarching themes:

- (1) Current Practices and Motivations;
- (2) Financial Considerations and Cost Implications;
- (3) Internal Barriers and Organisational Capacity; and
- (4) External Frameworks and Regional Influences. These are presented and analysed below, with institutional isomorphism (DiMaggio & Powell, 1983) applied as an interpretive framework throughout.

6.2 Emergent themes

6.2.1 Theme 1: Current Practices and Motivations

The dominant finding across participants was that sustainability is approached reactively and driven by client requirements rather than embedded as an internal strategic commitment. This was expressed consistently across roles and firm types:

"In our projects, it depends on the client... within our works, it's always down to the client as to how those procedures are carried out." (P3, Quantity Surveyor); *"Unless the client is asking for it, sustainability falls way down the list of my considerations."* (P2, Director). Formal sustainability practices, waste segregation, use of recycled materials, renewable energy installation, were reported as occurring primarily when specified contractually. Several participants confirmed PV panel installation and electric vehicle charging points had been delivered, but exclusively because these were embedded in client briefs (P7, Project Manager).

However, notable exceptions emerged. Two directors articulated genuinely values-driven motivations, framing sustainability as an organisational ideology rather than a compliance obligation:

"From a moral and ethical point of view, keeping fuel usage down, keeping waste down, reducing and recycling wherever possible, that's not just policy; that's basically an ideology we want to implement and improve." (P9, Director); *"Sometimes I think we push it more than some of the bigger firms."* (P11, Consultancy Director). These cases suggest that leadership disposition is a significant internal variable, capable of driving sustainability adoption independent of external mandates, a finding consistent with stakeholder and legitimacy theories in the broader literature (Darko et al., 2017).

6.2.2 Theme 2: Financial Considerations and Cost Implications

Cost emerged as the most consistently reported barrier across all eleven participants, operating through two interconnected mechanisms: competitive tendering pressure and limited access to financial support.

In competitive tendering environments, sustainability measures that increase upfront costs are routinely excluded from bids to remain price competitive. *"It can be difficult to recover these costs, especially when competing for tenders, if we include those additional costs, it can make us less competitive on price."* (P1, Contracts Manager); *"Even if we want to use a sustainable material, if it's more expensive, we probably won't. Lowest price wins."* (P10, Director).

This short termism extends to client relationships. Even where whole life value arguments exist, the budgetary reality of clients constrains decisions at the point of procurement. *"You could construct a perfectly sustainable net zero building that might save the client money over 50 years... but they don't have that money now. So, you need to give them a building that's affordable today."* (P9, Director).

Grant and incentive mechanisms were found to be inaccessible in practice. Participants described schemes as unclear, inconsistent, and administratively burdensome, a finding directly aligned with OECD (2021) analysis on disproportionate compliance costs for SMEs. *"PV grants... it all seems a bit unclear. One day it's available, the next day it's not. It's not the clearest setup."* (P9, Director).

One deviant case is analytically significant: P11 self-funded a net-zero office conversion, explaining it was *"quicker and simpler to fund it ourselves, especially when you factor in the time and admin involved in going for funding."* This illustrates a transaction cost dynamic where grant administration burden can exceed the financial benefit for resource-constrained SMEs, effectively making self-funding the rational choice for firms that can afford it, while excluding those that cannot.

6.2.3 Theme 3: Internal Barriers and Organisational Capacity

Three internal barriers were identified consistently across participants: staff resistance to changed working practices, uneven knowledge distribution between management and site level, and time and resource constraints that prevent training from being prioritised.

Staff resistance, particularly among long-serving operatives, was reported by six participants, making it the most frequently cited internal barrier. *"When we ask them to segregate waste... it's not second nature. They're used to throwing everything into one skip."* (P1, Contracts Manager). *"We'd be hard pushed to get the lads to strip everything and put it into the correct skips. They'd feel it's a waste of time and effort."* (P4, Site Manager).

A clear knowledge asymmetry was observed between management and site level. Directors and commercial staff demonstrated conceptual understanding of sustainability principles but cited time pressure as the operative constraint, while site operatives showed both lower awareness and higher resistance. As P3 noted, *"it's harder to teach an old dog new tricks."*

This office-to-site gap represents a critical implementation failure point, strategies developed at management level are not reliably translated into on the ground practice.

Training was widely recognised as the solution, but rarely actioned. *"It's the training. You can't just tell someone to do a whole new skill, if you can teach them to understand it, they'll know how to procure the work."* (P5, Commercial Manager). *"Knowledge isn't the problem, you can learn anything. But it's time. Everyone's busy doing the day job."* (P10, Director)

6.2.4 Theme 4: External Frameworks and Regional Influences

Engagement with formal frameworks, BREEAM and ISO 14001 in particular, was widespread but instrumentally motivated. BREEAM was consistently described as project-specific and client-imposed, while ISO 14001 was linked to framework eligibility and supply chain access rather than genuine environmental management. *"Lots of Welsh Government work requires BREEAM scores with sustainability embedded."* (P5, Commercial Manager). *"We have ISO 14001... We're also looking further into our carbon reduction plan."* (P9, Director).

Despite their prevalence, both frameworks attracted criticism for being recording heavy and disconnected from site practice. *"It's a tick box exercise, and we don't actually put into practice what we probably preach."* (P4, Site Manager). *"Too much of it is about recording, when the time would be better spent being proactive."* (P10, Director).

Regional support was found to be highly uneven. While P1 reported constructive engagement with local authority sustainability targets, P11 reported no contact or guidance from any regional body, a divergence that mirrors literature documenting fragmented and geographically inconsistent SME support (Enterprise Research Centre, 2023; OECD, 2021).

6.3 Institutional Isomorphism: Interpretive Analysis

The four themes collectively map onto DiMaggio and Powell's (1983) three isomorphic pressures in a revealing pattern. Coercive pressures, procurement rules, client specifications, and BREEAM requirements, are clearly the dominant driver; participants comply when mandated and deprioritise sustainability otherwise. Mimetic pressures are evident in SMEs adopting the policies, templates, and certification formats used by larger contractors to remain competitive in bids, yet several participants acknowledged these mirrored formats do not reflect genuine operational change, producing the "tick box" compliance reported across themes. Normative pressures, from professional accreditations and industry guidance, are present but weak: limited time, resource constraints, and insufficient site-level training prevent the diffusion of professional norms into everyday practice.

The net result is a pattern of reactive, coercively driven compliance combined with mimetic copying without parallel capability building, keeping sustainability adoption client-led and performative rather than strategic and embedded. This pattern is consistent across firm types and roles, though moderated by individual leadership disposition, as the deviant cases in Themes 1 (Current Practices and Motivations) and Theme 2 (Financial Considerations and Cost Implications) illustrate.

7.0 DISCUSSION

7.1 Internal Barriers and Organisational Capacity

The findings confirm a pattern of sustainability adoption that is predominantly reactive, externally mandated, and instrumentally motivated among private sector construction SMEs in North Wales and Northwest England. This is consistent with Revell and Blackburn's (2007) characterisation of SMEs as reactive actors, and with DiMaggio and Powell's (1983) institutional isomorphism framework: coercive pressure from clients and procurement requirements is the dominant driver, while normative and mimetic pressures, professional accreditations and peer benchmarking, produce surface level mimicry without embedded operational change.

Critically, this study finds that coercive pressure alone is insufficient to produce genuine sustainability integration. Where mandates are clear and contractually enforced, Welsh Government BREEAM requirements and PPN 06/21 Carbon Reduction Plans, SMEs comply. Where they are absent, as is typical in private-sector projects, sustainability is consistently deprioritised. This public private divergence has direct implications for quantity surveyors: cost plans, tender strategies, and procurement frameworks on private sector projects carry no equivalent sustainability obligation, meaning Quantity Surveying (QS) professionals have both the opportunity and the professional responsibility to introduce sustainability criteria into cost advice and value management processes proactively, rather than waiting for client specification.

The deviant cases in the dataset are instructive here. Two directors demonstrated values driven sustainability commitments that operated independently of client mandates, one self-funding a net zero office conversion, another embedding sustainability as an organisational ideology. Madrid Guijarro (2024) identifies strong managerial commitment as a central determinant of sustained sustainability practice in SMEs, suggesting that leadership disposition moderates the otherwise dominant coercive dynamic. For QS professionals advising SME clients, this points to the value of engaging directly with senior decision-makers to build the business case for sustainability, rather than treating it purely as a compliance item.

7.2 Financial Considerations and Cost Implications

The near universal identification of cost as the primary barrier to sustainability adoption carries specific implications for the quantity surveying profession. Participants consistently described a lowest price tendering culture in which sustainable materials and methods are excluded from bids not because their long-term value is disputed, but because upfront cost premiums are unrecoverable in competitive market conditions. As one director stated, even net zero buildings that deliver 50-year client savings cannot be delivered when clients lack the capital today (P9).

This represents a fundamental lifecycle costing challenge, and one that falls squarely within QS professional competence. The findings suggest that SME contractors and their clients would benefit significantly from QS led whole life cost appraisals that transparently model

the long-term financial returns of sustainable design decisions against short term capital premiums. Without this evidence base, sustainability remains a perceived cost rather than a quantified investment, a framing that the profession is uniquely positioned to reframe.

Access to green finance and incentive schemes remains a further barrier. Participants described grant mechanisms as inconsistent, administratively burdensome, and poorly tailored to SME operational realities, with transaction costs of application sometimes exceeding the financial benefit (P11). This aligns with OECD (2021) analysis on disproportionate compliance costs and the Enterprise Research Centre's (2023) finding that net zero support reaches fewer than 1% of UK SMEs. Available instruments, including the Plug in Van Grant and the Workplace Charging Scheme (Department for Transport, 2025; Office for Zero Emission Vehicles, 2022), exist but are insufficiently signposted. QS professionals, as commercial advisors embedded in project delivery, are well placed to identify and navigate relevant incentives on behalf of SME clients, reducing the information and administrative barriers that currently suppress uptake.

7.3 Motivations and Leadership Disposition

A persistent gap was identified between sustainability commitments made at management level and their translation into site-level practice, a dynamic driven by staff resistance, uneven knowledge distribution, and insufficient training investment. This office to site disconnects represents a critical implementation failure that certification and policy frameworks do not currently address: ISO 14001 and BREEAM operate primarily as documentation systems, and several participants characterised them as recording heavy tick box exercises disconnected from operational reality (P4; P10), consistent with Ferrón-Vílchez's (2016) evidence of symbolic certification without behavioural change.

Durrani et al. (2024) and Bassi and Guidolin (2021) identified training and green capability-building as among the most effective enablers of genuine sustainability integration in SMEs. The findings support this: participants who described meaningful sustainability practices, recycled aggregate use, waste segregation, EV transition planning, were those in firms where leadership had actively invested in staff understanding, not merely policy documentation. Jamil (2025) further argues that green intellectual capital and human resource development create durable organisational capacity that outlasts individual project requirements.

7.4 Implications for Policy and Practice

Collectively, the findings point to three actionable priorities. First, sustainability frameworks must be co-designed with SME input to reduce administrative burden and align evidence requirements with SME project scale, co design approaches involving standardised, minimal data sets (waste segregation rates, recycled content percentages, staff trained) across regional pilot schemes could bridge the gap between regulatory ambition and SME delivery capacity (OECD, 2022). Second, financial mechanisms must be restructured around SME cash-flow realities: simplified grants paid in advance rather than arrears, micro funding for small-scale site-level trials, and sustainability linked loan products with accessible eligibility criteria. Third, regional support structures must be strengthened and made consistent, the significant variation in local authority guidance reported by participants is a structural inequity that

disadvantages SMEs in less-supported regions and undermines the coherence of national sustainability policy.

For quantity surveyors specifically, these findings reinforce the profession's evolving role as a sustainability enabler, translating carbon and lifecycle cost data into commercially viable procurement strategies, identifying and accessing green finance on behalf of clients, and embedding sustainability criteria into tendering and supply chain management processes, not as add-ons, but as core professional competencies.

8.0 CONCLUSION

This study examined the internal barriers, motivations, and cost implications of sustainability adoption among private sector construction SMEs in North Wales and Northwest England, drawing on thematic analysis of eleven semi structured interviews. The findings advance understanding in three areas with direct relevance to construction professionals and policymakers.

First, sustainability adoption among these SMEs is predominantly reactive, client-driven, and compliance-oriented rather than strategically embedded. Formal frameworks such as BREEAM and ISO 14001 are engaged with instrumentally, as gateways to work rather than drivers of operational change, producing a pattern of mimetic compliance without parallel capability building (DiMaggio & Powell, 1983; Ferrón-Vílchez, 2016). Where client mandates are absent, as is typical in private-sector procurement, sustainability is consistently deprioritised.

Second, cost is both the most significant barrier and the most promising lever for intervention. Competitive tendering environments suppress sustainable material and method adoption through a lowest-price culture, while grant and incentive mechanisms remain inaccessible in practice due to administrative complexity and poor SME-specific design (OECD, 2021; Enterprise Research Centre, 2023). The transaction costs of accessing support can exceed the financial benefit, a dynamic that disadvantages the smallest firms most acutely and reinforces a short-term affordability focus over long-term sustainability investment.

Third, an office-to-site implementation gap, driven by staff resistance, uneven knowledge distribution, and insufficient training investment, limits the translation of management-level sustainability commitments into operational practice. Leadership disposition emerged as the key moderating variable: firms with directors who had genuinely internalised sustainability as an organisational value demonstrated meaningfully more advanced practices than those relying solely on external mandates. This finding aligns with Madrid-Guijarro and Duréndez (2024), who identify management commitment as a central mediator between external sustainability pressures and SME environmental performance.

For practitioners, these findings reinforce the quantity surveyor's evolving role as a sustainability enabler: embedding lifecycle cost appraisals into procurement advice, navigating green finance on behalf of SME clients, and introducing sustainability KPIs into private-sector tender and supply chain frameworks where no regulatory obligation currently

exists. For policymakers, the study supports three targeted interventions: co-designed, SME proportionate compliance frameworks that reduce administrative burden; simplified, advance payment financial mechanisms accessible to cash-constrained smaller firms; and subsidised leadership and site level training programmes that build durable green capability rather than paper compliance.

The study's scope, eleven participants across two regions, using purposive sampling, means findings should be read as context-specific and exploratory rather than statistically generalisable. Future research should broaden the sample to include micro-firms and site-based operatives, extend to additional UK regions, and employ longitudinal designs to track how internal capabilities evolve alongside changing regulatory and market conditions.

Ultimately, the construction sector's transition to sustainability cannot be achieved through regulation alone. Without financial mechanisms, training investment, and policy frameworks designed around SME realities, private sector contractors will remain locked in reactive compliance, meeting the letter of sustainability requirements without embedding the spirit of them into the buildings they deliver.

9.0 REFERENCES

- Al Koliby, I.S., Noor, N.H.M., Al-Swidi, A.K., Al-Hakimi, M.A., & Mehat N.A.B. (2025). Enhancing sustainable performance among manufacturing SMEs: The interplay of knowledge management and organizational structure. *Discover Sustainability*, 6, 469. <https://doi.org/10.1007/s43621-025-01351-1>
- Ajayi, S.O., Oyedele, L.O., Bilal, M., Akinade, O.O., Alaka, H.A., Owolabi, H.A., & Kadiri, K.O. (2015). Waste effectiveness of the construction industry: Understanding the impediments and requisites for improvements. *Resources, Conservation & Recycling*, 102, 101-112. <https://doi.org/10.1016/j.resconrec.2015.06.001>
- Balzano, M., Marzi, G., & Turzo, T. (2025). SMEs and institutional theory: Major inroads and opportunities ahead. *Management Decision*, 63, 1-27. <https://doi.org/10.1108/MD-05-2023-0734>
- Bassi, F., & Guidolin, M. (2021). Resource efficiency and circular economy in European SMEs: Investigating the role of green jobs and skills. *Sustainability*, 13(21), 12136. <https://doi.org/10.3390/su132112136>
- BEIS (2019). SME Energy Efficiency Scheme: Programme overview. London: BEIS. Available at: <https://www.gov.uk/government/publications/sme-guide-to-energy-efficiency> (Accessed: 31 August 2025).
- BEIS (2022). Home Decarbonisation Skills Training Competition: Guidance. London: Department for Business, Energy & Industrial Strategy. Available at: <https://assets.publishing.service.gov.uk/media/64beb7c1d4051a000d5a9218/home-decarbonisation-skills-training-competition-2023-guidance.pdf> (Accessed: 26 August 2025).
- Berger, R. (2013). Now I see it, now I don't: Researcher's position and reflexivity in qualitative research. *Qualitative Research*, 15(2), 219-234. <https://doi.org/10.1177/146879411246847>
- Bocken, N.M.P., & Short, S.W. (2021). Unsustainable business models – Recognising and resolving institutionalised social and environmental harm. *Journal of Cleaner Production*, 312, 127828. <https://doi.org/10.1016/j.jclepro.2021.127828>
- Brammer, S., Hoejmose, S., & Marchant, K. (2012). Environmental management in SMEs in the UK: Practices, pressures and perceived benefits. *Business Strategy and the Environment*, 21, 423-434. <https://doi.org/10.1002/bse.717>
- BRE Global (2025). A guide to how BREEAM works. Available at: <https://breeam.com/about/how-breeam-works> (Accessed: 2 September 2025).
- Bristol City Council (2024). Greener High Streets Grant – Guidance Notes. Bristol: Bristol City Council. Available at: <https://www.bristol.gov.uk/files/documents/7809-greener-high-streets-grant-guidance-notes/file> (Accessed: 25 August 2025).

- Cabinet Office (2022). The Construction Playbook (September 2022). London: Cabinet Office. Available at: https://assets.publishing.service.gov.uk/media/6312222de90e075880923330/14.116_CO_Construction_Playbook_Web.pdf (Accessed: 28 August 2025).
- Cabinet Office (2021). Procurement Policy Note 06/21: Taking account of Carbon Reduction Plans in the procurement of major government contracts. London: Government Commercial Function. Available at: <https://www.gov.uk/government/publications/procurement-policy-note-0621-taking-account-of-carbon-reduction-plans-in-the-procurement-of-major-government-contracts> (Accessed: 30 August 2025).
- Chassé, S., & Boiral, O. (2017). Legitimizing corporate (un) sustainability: A case study of passive SMEs. *Organization & Environment*, 30(4), 324-345. <https://doi.org/10.1177/108602661667206>
- Chen, J., Calabrese, R., & Cowling, M. (2024). Does energy efficiency of UK SMEs affect their access to finance?. *Energy Economics*, 129, 107251. <https://doi.org/10.1016/j.eneco.2023.107251>
- Chmeit, R., Lyu, J., & Pitt, M. (2024). Implementation challenges of Building Information Modelling (BIM) in Small to Medium-Sized Enterprises (SMEs) participating in public projects in Qatar. *Computer and Decision Making: An International Journal*, 1, 252-279. <https://doi.org/10.59543/comdem.v1i.11035>
- CITB (2024). Construction Skills Network (CSN) 2024–2028 Industry Outlook. Peterborough: Construction Industry Training Board. Available at: <https://www.citb.co.uk/about-citb/construction-industry-research-reports/construction-skills-network-csn> (Accessed: 25 August 2025).
- Darko, A., Zhang, C., & Chan, A.P.C. (2017). Drivers for green building: A review of empirical studies. *Habitat International*, 60, 81-90. <https://doi.org/10.1016/j.habitatint.2016.12.007>
- Department for Levelling Up, Housing and Communities (2023). Conservation of fuel and power: Approved Document L. GOV.UK. Available at: <https://www.gov.uk/government/publications/conservation-of-fuel-and-power-approved-document-l> (Accessed: 1 September 2025).
- Department for Transport and Office for Zero Emission Vehicles (2025). Low-emission vehicles eligible for a plug-in grant: Vans. GOV.UK. Available at: <https://www.gov.uk/plug-in-vehicle-grants/vans> (Accessed: 25 August 2025).
- DiMaggio, P.J., & Powell, W.W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48(2), 147-160.
- Durrani, N., Raziq, A., Mahmood, T., & Khan, M.R. (2024). Barriers to adaptation of environmental sustainability in SMEs: A qualitative study. *PLOS ONE*, 19(5), e0298580. <https://doi.org/10.1371/journal.pone.0298580>
- Energy Saving Trust (2025). Total cost of ownership and moving to high capital, low operational costs. Fleet Decarbonisation Toolkit. Available at: <https://fleetdecarbonisationtoolkit.energysavingtrust.org.uk/t/decarbonisation-strategy/reducing-reliance-on-grant-funding-to-decarbonise-your-fleet/total-cost-of-ownership/> (Accessed: 20 August 2025).
- Enterprise Research Centre (2023). The less than 1% Club: Mapping net zero support for small businesses across England. Birmingham/Coventry: ERC for the Federation of Small Businesses.
- Environment Agency (2015). Refuse derived fuel exports (RDF): recent trends. Available at: <https://www.gov.uk/government/publications/refuse-derived-fuel-exports-rdf-recent-trends>
- Flanagan, R., & Jewell, C. (2008). Whole life appraisal for construction. Available at: <https://doi.org/10.1002/9780470773635>
- Fresner, J., Krenn, C., Haddad, J., Abdallah, R., Matalqa, B., & Abu Sada, A. (2025). A new approach to motivate micro and small enterprises for resource-efficient and cleaner production in Jordan. *Sustainability*, 17(6), 2404. <https://doi.org/10.3390/su17062404>
- Garay, L., & Font, X. (2022). Sustainable development barriers and pressures in SMEs: The role of managerial environmental commitment. *Business Strategy and the Environment*, 31(2), 567-580. <https://doi.org/10.1002/bse.3537>
- Government Office for Science (2017). From waste to resource productivity: Evidence and case studies. London: Government Office for Science. Available at: <https://assets.publishing.service.gov.uk/media/5a748870ed915d0e8e398f35/from-waste-to-resource-productivity-evidence-case-studies.pdf> (Accessed: 22 August 2025).
- Häkkinen, T., & Belloni, K. (2011). Barriers and drivers for sustainable building. *Building Research & Information*, 39(3), 239-255. <https://doi.org/10.1080/09613218.2011.561948>
- Hashim, R., Cooper, S., Salleh, N.A., & Naw, M.N.M. (2022). The influence of regulatory pressure in shaping construction firms' decision to adopt green innovation. *Journal of Advanced Research in Applied Sciences and Engineering Technology*, 28(2), 301-310. <https://doi.org/10.37934/araset.28.2.301310>

- HM Government (2023). The Building Regulations 2010: Approved Document L. Available at: <https://www.gov.uk/government/publications/conservation-of-fuel-and-power-approved-document-l> (Accessed: 3 September 2025).
- Hoekman, B., & Taş, B.K.O. (2022). Procurement policy and SME participation in public purchasing. *Small Business Economics*, 58, 383–402. <https://doi.org/10.1007/s11187-020-00414-z>
- Hwang, B.-G., & Tan, J.S. (2012). Green building project management: Obstacles and solutions for sustainable development. *Sustainable Development*, 20(5), 335–349. <https://doi.org/10.1002/sd.492>
- International Organization for Standardization (ISO) (2015) ISO 14001: Environmental Management Systems – Requirements with Guidance for Use.
- Jamil, K., Zhang, W., Anwar, A., & Mustafa, S. (2025). Driving SME sustainability via the influence of green capital, HRM, and leadership. *Sustainability*, 17(13), 6076. <https://doi.org/10.3390/su17136076>
- Jenkins, H. (2006). Small business champions for corporate social responsibility. *Journal of Business Ethics*, 67, 241–256. <https://doi.org/10.1007/s10551-006-9182-6>
- Jenkins, H. (2009). A “business opportunity” model of corporate social responsibility for small and medium-sized enterprises. *Business Ethics: A European Review*, 18, 21–36. <https://doi.org/10.1111/j.1467-8608.2009.01546.x>
- John, I.B., Adekunle, S.A., & Aigbavboa, C.O. (2023). Adoption of circular economy by construction industry SMEs: Organisational growth transition study. *Sustainability*, 15(7), 5929. <https://doi.org/10.3390/su15075929>
- Johnson, M.P. (2015). Sustainability management and small and medium-sized enterprises: Managers’ awareness and implementation of innovative tools. *Corporate Social Responsibility and Environmental Management*, 22, 271–285. <https://doi.org/10.1002/csr.1343>
- Kannan, S., & Gambetta, N. (2025). Technology-driven sustainability in small and medium-sized enterprises: A systematic literature review. *Journal of Small Business Strategy*, 35(1), 129–157. <https://doi.org/10.53703/001c.126636>
- Kenny Waste Management Ltd (2020). Waste Management Proposal: Widnes Project. Available at: https://webapp.halton.gov.uk/planningapps/2000181COND/OTH_Mulbury%20Waste%20Management%20Proposal%20Kenny%20Waste.pdf (Accessed: 24 August 2025).
- Khosravi, F., Jelliman, S., Uchendu, C., Haddad, H., Chandler, A., & Connop, S. (2024). Policy recommendations to enhance small-to-medium-sized enterprise support for achieving the UK’s net zero targets. *Sustainability*, 16, 10116. <https://doi.org/10.3390/su162210116>
- Kim, S., Rao, V., & Zaha, O. (2021). Journal of financial economics, forthcoming. European Corporate Governance Institute – Finance Working Paper No. 817/2022; Proceedings of Paris December 2021 Finance Meeting EUROFIDAI – ESSEC. Available at: <http://dx.doi.org/10.2139/ssrn.3865147> (Accessed: 1 September 2025).
- Krumpal, I. (2013). Determinants of social desirability bias in sensitive surveys: a literature review. *Quality & Quantity*, 47, 2025–2047. <https://doi.org/10.1007/s11135-011-9640-9>
- Lindblad, H., & Karrbom Gustavsson, T. (2021). Public clients ability to drive industry change: The case of implementing BIM. *Construction Management and Economics*, 39(1), 21–35. <https://doi.org/10.1080/01446193.2020.1807032>
- Maqbool, R., Rashid, Y., Altuwaim, A., Shafiq, M.T., & Oldfield, L. (2024). Coping with skill shortage within the UK construction industry: Scaling up training and development systems. *Ain Shams Engineering Journal*, 15(2), 102396. <https://doi.org/10.1016/j.asej.2023.102396>
- Madrid-Guijarro, A., & Duréndez, A. (2024). Sustainable development barriers and pressures in SMEs: The mediating effect of management commitment to environmental practices. *Business Strategy and the Environment*, 33(2), 949–967. <https://doi.org/10.1002/bse.3537>
- Nottingham City Council (2025). Business Decarbonisation Grant 2025–2026: Applicant Guidance Notes. Nottingham: Nottingham City Council. Available at: <https://www.nottinghamcity.gov.uk/media/2a3g0wjm/business-decarbonisation-grant-2025-2026-applicant-guidance.pdf> (Accessed: 21 August 2025).
- OECD (2022). OECD Regions and Cities at a Glance 2022. Paris: OECD Publishing. Available at: <https://doi.org/10.1787/14108660-en>
- OECD (2021). ‘SME and entrepreneurship policy frameworks across OECD countries: An OECD Strategy for SMEs and Entrepreneurship’, OECD SME and Entrepreneurship Papers, No. 29. Paris: OECD Publishing. Available at: <https://doi.org/10.1787/9f6c41ce-en>

- Office for Zero Emission Vehicles (2022). 2026 Workplace Charging Scheme. Find a grant - GOV.UK. Available at: <https://www.find-government-grants.service.gov.uk/grants/workplace-charging-scheme-2> (Accessed: 23 August 2025).
- Parahoo, K. (2006). *Nursing research principles, processes and issues* (2nd ed.). Hampshire, UK: Palgrave Macmillan.
- Peñasco, C. (2024). From policy to practice: The role of national policy instruments and social barriers in UK energy efficiency adoption in households. *Energy Policy*, 194, 114308. <https://doi.org/10.1016/j.enpol.2024.114308>
- Perrini, F., Russo, A., & Tencati, A. (2007). CSR Strategies of SMEs and large firms. evidence from Italy. *Journal of Business Ethics*, 74, 285-300. <https://doi.org/10.1007/s10551-006-9235-x>
- Purwandani, J.A., & Michaud, G. (2021). What are the drivers and barriers for green business practice adoption for SMEs?. *Environmental Systems and Decisions*, 41, 577-593. <https://doi.org/10.1007/s10669-021-09821-3>
- Procurement Act (2023) C. 54, Part 13, Section 123. Available at <https://www.legislation.gov.uk/ukpga/2023/54/section/123>
- Ramanathan, R. (2008). 'The role of organisational change management in offshore outsourcing of information technology services'.
- Revell, A. (2007). The ecological modernisation of SMEs in the UK's construction industry. *Geoforum*, 38(1), 114-126. <https://doi.org/10.1016/j.geoforum.2006.07.006>
- Revell, A., & Blackburn, R. (2007). The business case for sustainability? An examination of small firms in the UK's construction and restaurant sectors. *Business Strategy and the Environment*, 16, 404-420. <https://doi.org/10.1002/bse.499>
- Rizos, V., Behrens, A., Van der Gaast, W., Hofman, E., Ioannou, A., Kafyeke, T., Flamos, A., Rinaldi, R., Papadelis, S., Hirschnitz-Garbers, M., & Topi, C. (2016). Implementation of circular economy business models by Small and Medium-Sized Enterprises (SMEs): Barriers and enablers. *Sustainability*, 8(11), 1212. <https://doi.org/10.3390/su8111212>
- Ryan, G. (2018). Introduction to positivism, interpretivism, and critical theory. *Nurse Researcher*, 25(4), 41-49.
- Sourani, A., & Sohail, M. (2011). Barriers to sustainable construction in the UK. *Proceedings of the Institution of Civil Engineers – Engineering Sustainability*, 164(4), 229-237. <https://doi.org/10.1680/ensu.2011.164.4.229>
- Saunders, M., Lewis, P., & Thornhill, A. (2023). *Research Methods for Business Students*. Harlow: Pearson Education Limited. Available from: ProQuest Ebook Central (Accessed: 28 August 2025).
- Seidu, R., Momoh, J., Ebohon, O., Young, B., & Adamu, Z. (2022). Adoption of Building Information Modelling (BIM) by Small and Medium UK Construction Enterprises (SMEs). Paper presented at ASOCSA 16th Built Environment International Conference, 26/09/22. Available at: <https://researchportal.lsbu.ac.uk/en/publications/adoption-of-building-information-modelling-bim-by-small-and-medium-3>
- Suchek, N., & Franco, M. (2023). Inter-organisational cooperation oriented towards sustainability involving smes: a systematic literature review. *Journal of the Knowledge Economy*, 15, 1952-1972. <https://doi.org/10.1007/s13132-023-01196-x>
- Vidalakis, C., Abanda, F.H., & Oti, A.H. (2020). BIM adoption and implementation: focusing on SMEs. *Construction Innovation: Information, Process, Management*, 20(1), 128-147. <https://doi.org/10.1108/CI-09-2018-0076>
- Walker, H., Di Sisto, L., & McBain, D. (2008). Drivers and barriers to environmental supply chain management practices: Lessons from the public and private sectors. *Journal of Purchasing and Supply Management*, 14(2), 69-85. <https://doi.org/10.1016/j.pursup.2008.01.007>
- Wao, J., Ries, R., Flood, I., & Kibert, C. (2016). Refocusing value engineering for sustainable construction. In 52nd ASC Annual International Conference Proceedings (pp. 13-16).
- Welsh Government (2015). *Well-being of Future Generations (Wales) Act 2015*. Welsh Government Publication. Available at: <https://www.legislation.gov.uk/anaw/2015/2/contents> (Accessed: 20 August 2025).
- Welsh Government (2023). *Procurement: Community Benefits Measurement Tool (v10)*. Cardiff: Welsh Government. Available at: <https://www.gov.wales/procurement-community-benefits-measurement-tool-v10> (Accessed: 27 August 2025).

- Welsh Government (2025). Approved Document L: Conservation of fuel and power. Cardiff: Welsh Government. Available at: <https://www.gov.wales/approved-document-l-conservation-fuel-and-power> (Accessed: 3 September 2025).
- Williams, S., & Schaefer, A. (2013). Small and medium-sized enterprises and sustainability: managers' values and engagement with environmental and climate change issues. *Business Strategy and the Environment*, 22, 173-186. <https://doi.org/10.1002/bse.1740>