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***Sustainability Practices Uptake by Small-to-
Medium Sized Enterprises in Ireland:
Challenges and Opportunities***

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DECLARATION

I, Kanishka Mendhekar, as the author of this thesis, hereby declare that, except where duly acknowledged, this thesis is entirely my own work and has not been submitted for any degree or qualification in any other university or country.

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We hereby certify that all the unreferenced work described in this thesis and submitted for the award of Doctor of Philosophy, is entirely the work of Kanishka Mendhekar. No portion of the work contained in this thesis has been submitted in support of an application for another degree or qualification to this or any other institution.

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To the woman whose strength and love have fuelled my academic pursuit, this thesis is dedicated to you, Mom. Thank you for being my rock.

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Abstract

Small to medium enterprises or SMEs significantly contribute to national economic development and growth. They also have a substantial environmental footprint and effective uptake of sustainability practices is seen as problematic, primarily because of limited resources. This study aims to develop an understanding of awareness and associated sustainability practices by SME owners and extend this understanding towards activating the collective potential of small businesses as environmental agents that research suggests could be powerful.

The study used a mixed-method approach based on a survey, interviews with five (5) business owners and secondary data from thirty (30) business reports to explore two research questions (RQ). RQ1, concerned with attitudes and intentions by business owners to implement sustainability practices, was examined using the Theory of Planned Behaviour. RQ2, an exploratory effort to unpack the decision rules that business owners typically adopt in practice, was a qualitative study using interdependence theory. A total of 589 survey responses were received, with 516 surveys retained after data cleansing. The quantitative (deductive) analysis identifies strong awareness of and support for sustainability by business owners: over 90 per cent support (52.34% fully agree and 37.68% concur) the need to adopt and/or integrate sustainability into business strategies. Key drivers noted include owner awareness and knowledge, and sustainability culture has an influence on subjective norms. Barriers to uptake included access to infrastructure and resources, as well as the owner's mindset. Overall, the evidence is that uptake of sustainability is low, with the data noting general reluctance by nearly 70 per cent of owners to adopt sustainability.

For RQ2, analysis based on the Gioia methodology departs from inductive reasoning towards an abductive approach that combines emerging data with existing theory. Practically, at a micro level, this study identifies (internal) structural and (external) environmental interdependencies that shape the trajectory of sustainability uptake. Collectively, distinctive decision rules associated with four entrepreneurial categories are noted: '*Yes Innovative and 'Yes Substitute*' that respectively reflect creative or opportunity discovery behaviours, and an allocative (*Yes But*) cautious approach oriented to immediate returns, but with latent potential for adaptations in

relation to sustainability. A fourth significantly large SME category titled '*No Because*' is also noted. The focus of this category is on survival and maintenance of the status quo. Primary concerns are costs, lack of clarity with sustainability reporting and uncertainty with green tech performance.

Theoretically, the study adds two ideas to the scholarly discourse on sustainability practices in Irish SMEs. First, noting two distinct types of business models, value-creation and revenue, this study explains why some SMEs adopt sustainability practices, while others do not. Revenue-based business models lack actor-specific enablers, such as entrepreneurial outlook and strategy planning, and likely only adopt sustainability practices if required. Second, this study draws attention to the less studied processual dimension in theorisation related to entrepreneurial ecosystems. This study presents a process-based framework to navigate the nuanced complexities of the various sectors and local contexts for SMEs. Regulatory clarity aside, wider (collective) uptake is arguably embodied in sympathetic strategy and business model design by SMEs and the creation of ecosystem-wide social capital. Finally, noting the role of external social pressure in shaping sustainability intentions, impact measures that reflect societal expectations, industry norms and networks are highlighted as antecedents to sustainability uptake and to scalable impact.

KEYWORDS: Sustainability Practices, SMEs, Gioia Methodology, Interdependencies, Entrepreneurial Outlook

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Glossary

AIC	Akaike Information Criterion
AMOS	Analysis of Moment Structures – A software used for SEM analysis.
AVE	Average Variance Extracted
B2B	Business to Business
B2C	Business to Customer
BCC	Browne-Cudeck Criterion
BDS	Business Development Services
BIC	Bayesian Information Criterion
CAIC	Consistent Akaike Information Criterion
CB-SEM	Co-variance Based (CB) -SEM
CDP	Carbon Disclosure Project
CFI	Comparative Fit Index
CMIN/DF	Chi-Square Minimum Discrepancy Divided by Degree of Freedom
CR	Composite Reliability
CS	Corporate Sustainability
CSR	Corporate Social Responsibility
CSRD	Corporate Sustainability Reporting Directive
EFA	Exploratory Factor Analysis
EO	Entrepreneurial Opportunity
EO	Entrepreneurial Orientation
ESG	Environmental, Social and Governance
EU	European Union
EVIC	Expected Value Information Criterion
FB	Family Business
GDP	Gross Domestic Product

GFI	Goodness-of-Fit
GM	Gioia Methodology
GRI	Global Reporting Initiative (An UN-devised set of standards for reporting environmental, social and economic impacts)
GRIA	Government's Regulatory Impact Analysis (GRIA)
GVA	Gross Value Added (per person)
HI90	Upper 90% Confidence Interval Bounds
HOC	Higher Order Construct
IRC	Irish Research Council
ISO	International Organisation for Standardization
LO90	Lower 90% Confidence Interval Bounds
LVS	Latent Variable Scores
MECVI	Modified Expected Cross-Validation Index
MGA	Multi-Group Analysis
MMR	Mixed Methods Research
OECD	Organisation for Economic Co-operation and Development
P	Probability Value (p-value)
PBC	Perceived Behaviour Control
PLS-SEM	Partial Least Square – Structural Equation Modelling
RF	Research Framework
RMSEA	Root Mean Square Error of Approximation
RO	Research Objectives
RQ	Research Question
SASB	Sustainability Accounting Standards Board
SB	Small Business
SBN	Sustainable Business Network
SDGs	Sustainable Development Goals

SEAI	Sustainable Energy Authority of Ireland
SEM	Structural Equation Modelling
SMEs	Small-to-Medium Sized Enterprises
SN	Subjected Norms
SP	Sustainability Practices
SPSS	Statistical Package for Social Science
SPSS	Statistical Package for Social Sciences
SVI	Social Value International
TA	Thematic Analysis
TBL	Triple Bottom Line (Financial, Social, Environmental)
TLI	Tucker-Lewis Index
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UN	United Nations
UNGC	United Nations Global Compact
VIF	Variance Inflation Factor
WB	World Bank
WBCSD	World Business Council for Sustainable Development
WCED	World Commission on Environment and Development

Key Terms

Entrepreneurial opportunity	Three views (Sarasvathy <i>et al.</i> , 2010)
Entrepreneurial Orientation	A behavioural measure of innovation (Sheppard, 2023)
Gioia Methodology	Gioia Methodology is a systematic, qualitative approach to research that emphasises building theory through inductive analysis of data, particularly in organisational and management studies (Magnani and Gioia, 2023).
Interdependencies	Social exchange theory that states interpersonal relationships are defined through interpersonal interdependence – these relationships can be Synergistic, Conflictual or Retrograde (unintended consequences).
Prosocial attitude	Prosocial attitude is defined as positive voluntary actions intended to benefit another person or group (Sarasvathy <i>et al.</i> , 2010)
Scaling	Expanding impact beyond a limited community (geographic or human) to a greater level; from “reaching many” to sustainable systems change at scale (Woltering <i>et al.</i> , 2019).
Scope 1,2, 3	Categorising carbon emissions a company creates via its own and wider value chain.
SDG Interconnectedness	SDG interconnectedness shows how actions directed towards one SDG can influence others.

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Chapter 1: Study Overview

1.1. Introduction

Small to medium enterprises or SMEs make a significant contribution to national economic development and growth (Bjørnskov and Foss, 2016; McCann, McGeever and Yao, 2023), but from a sustainability perspective, they also have a substantial (negative) environmental footprint. Thus, while attention in sustainability literature is largely focused on large enterprises (LE) and technical solutions, there is a need for greater focus on Irish SMEs where limited resources and a priority on survival make the transition to sustainability problematic (Martinez-Cillero, Lawless and O'Toole, 2020; Batrancea *et al.*, 2022). Moreover, recognising the shadow of EU legislation and ESG reporting with specific requirements will trickle down and impact SMEs, sustainability uptake is still more than simply a compliance issue. It depends on good strategy, governance and effective decision-making by business owners. Understanding these interdependencies as a prerequisite (Keser, 2023), this study seeks to develop a clearer understanding of the challenges and opportunities that currently face sustainability uptake by SMEs in Ireland.

Dey, Chrysovalantis Malesios, et al. (2022) define SMEs by turnover and number of employees. Typically, a medium-sized business has <250 employees, and a turnover of less than or equal to €50 million or a balance sheet total of less than €43 million (European Commission, 2020). A small business has <50 employees and ≤ € 10 million, while a micro business has <10 employees and a turnover of ≤ € 2 million. These small businesses are described as the bedrock of most economies (Gaganis, Pasiouras and Voulgari, 2019; Ozkan, Romagnoli and Rossi, 2023). According to the World Bank, they constitute around 90% of businesses and create 50% of all jobs worldwide, and are key vehicles for employment, value chain development, economic and social inclusion, and resilience in the face of conflict (World Bank Group, 2019).

In Europe, much like other economies, SMEs are the backbone of the economy, representing more than 90% of businesses and providing more than 50% of employment (Muller et al., 2021; Word Back, 2023). In Ireland, SMEs in 2021

accounted for 99.8% of all enterprises and 69.2% of persons employed (CSO, 2021). Of this data from 2021, micro-enterprises (businesses with fewer than 10 employees) made up 92.6% of all small businesses, according to the Central Statistics Office (2023). A further breakdown of key sectors related to SMEs shows that:

- The Services sector represented 60.9% of all SMEs in Ireland's business economy.
- This (Services) sector also employed the largest share of SME workers in 2021, accounting for 58.4% and contributed 44.2% to the turnover within this category. Conversely, Manufacturing employed the smallest percentage (9.3%) of the workforce, but generated 13.1% of SME turnover.
- The Construction sector was the second largest in terms of SME numbers, comprising 20.2% of the total, while Manufacturing represented 5.2% of all SMEs.

1.1.1 Small Businesses Performance

The evidence shows small businesses are experiencing a high failure rate in Ireland. Business data suggests that 20% of new companies fail in the first year, and nearly 60% don't make it past 5 years. The challenges vary by sector, but hospitality (extreme) and retail (high) suffer the most (Business Ireland, 2024; Tyrrell, 2024). The common issues are poor management, cash shortages and a competitive environment. These challenges are not just limited to Ireland but are also shared more commonly across the UK and Europe.

When evaluating micro-business performance, key business indicators include labour productivity, personnel costs as a percentage of Gross Value Added (GVA), and profitability. These indicators provide useful insights into the specific context of SMEs, and they also flag the potential or otherwise for SMEs adopting sustainability practices. In 2021, key performance data for Ireland included: Small Irish-owned businesses (10-49 employees) achieved a GVA per person of €48,038, while medium-sized enterprises (50-249 employees) reported €60,138 GVA per person. Personnel costs accounted for an average of 38.6% of GVA for SMEs, compared to 13.9% for large enterprises. In large manufacturing businesses, personnel costs were 5.4% of GVA, compared to 40.7% for SMEs in the same sector. The gross operating surplus,

which is a measure of income from production (GOS), after labour costs, was 25.2% of turnover for all businesses in Ireland's economy. For large enterprises, this figure was 31.2%, while for Irish-owned businesses the GOS was 5.4% of turnover.

Aside from the significant percentage of micro businesses (92.6%) in the Irish economy, SMEs operate in a highly competitive environment characterised by demand-side uncertainties, cash flow issues, lack of standardised business practices, skill shortages, and high employee turnover. As a result, they often lack the information, time or expertise to deal with administrative tasks, and understandably regulations have a disproportionate effect in terms of compliance cost and administrative burden (An Roinn Fiontar, 2022). Unsurprisingly, a common anecdotal phrase in relation to sustainability is *no time, no money, no knowledge* (Participant 4). To quantify the challenge, based on Department of Enterprise, Trade and Employment (DETE) figures depicted in Table 1, while a large company may spend one euro /employee to comply with a regulatory duty, a medium-sized enterprise may spend four euros and a small business up to ten euros /employee. The disproportionate burden is explained by the fixed cost of regulation, lower efficiency of small businesses and the fact already busy owners need to take on the regulatory burden.

Table 1. SMEs in Ireland (Source: European Commission, 2019)

Class	Number of Enterprises			Number of Persons Employed			Value Added		
	Ireland		EU-28	Ireland		EU-28	Ireland		EU-28
	Number	Share	Share	Number	Share	Share	Billion €	Share	Share
Micro	242,501	91.9%	93.0%	406,580	27.6%	29.7%	48.0	21.7%	20.8%
Small	17,752	6.7%	5.9%	335,843	22.8%	20.1%	24.0	10.8%	17.6%
Medium-sized	3,085	1.2%	0.9%	291,975	19.8%	16.8%	20.0	9.0%	18.0%
Total SMEs	263,338	99.8%	99.8%	1,034,398	70.1%	66.6%	91.9	41.5%	56.4%
Large	577	0.2%	0.2%	440,943	29.9%	33.4%	129.6	58.5%	43.6%
Total	263,915	100.0%	100.0%	1,475,341	100.0%	100.0%	221.5	100.0%	100.0%

This reported disproportionate burden makes it especially difficult for smaller businesses to keep up with regulations, as they often lack the resources and time. As a result, the priority for many SMEs is simply business survival, supported by the wide use of exemptions, for example longer reporting intervals (annual vs quarterly) and a

lower frequency of audits are common practice in Ireland (Adomako and Ahsan, 2022). Further support is evident by DETE policy (p6) that introduced a “small business test,” to make regulations simpler to understand, easier to use and more practical to apply (Osano and Languitane, 2016; Neville and Lucey, 2022).

Mitigating compliance and administrative costs appear a key driver of the Government’s Regulatory Impact Analysis (GRIA), while the DETE policy document adds an important caveat, that consideration should also be given to the impact on innovation (Mushtaq, Gull and Usman, 2022). The caveat is important for sustainability as innovation has proven to be a driver for most UN sustainable development goals (Cordova and Celone, 2019) and the unfortunate reality associated with SMEs—is that they have a net cumulative negative contribution to environmental degradation (Gaganis, Pasiouras and Voulgari, 2019; Ozkan, Romagnoli and Rossi, 2023). Related literature suggests SMEs contribute 60–70% of industrial pollution in Europe, with manufacturing as a major contributing sector (OECD, 2019).

1.1.2 Small Businesses and Sustainability

There is a growing realisation that small businesses have been overlooked in the implementation of the sustainable development goals (Galpin, Whittington and Bell, 2015; Sachs *et al.*, 2019; Smith *et al.*, 2022). For example, while the evidence is that companies along with national governments and global institutions are designated as vital partners, the involvement of SMEs is scarce (Smith *et al.*, 2022). There is also a suggestion that SMEs struggle to understand the role they can play in the SDG framework (Pizzi *et al.*, 2020). These are key oversights given SMEs reputedly have unique strengths, such as innovation, responsiveness and other specific skills and resources (see Porter and Kramer, 2018; Di Vaio *et al.*, 2020) and are separately described as sustainable developmental agents (Mio, Panfilo and Blundo, 2020). These contrasting realities mirror the paradoxical nature of SMEs: small and constrained when operating individually, but with considerable potential when considered together (Smith *et al.*, 2022). This point connects with literature in Chapter 2 related to tipping points - *How Little Things Can Make a Big Difference*. For scalable change (impact), in contrast to aggregate change, the idea is to shift the focus from single businesses to **many** (Woltering *et al.*, 2019).

For this reason, there is an arguable need to unpack how these businesses can be nudged towards adopting practices such as reduced energy consumption and carbon emissions and improved waste management and labour practices throughout the supply chain. Research suggests that adopting environmentally and socially friendly practices by SMEs is largely determined by economic considerations (Dey, 2016; Dey, Chrisovaladis Malesios, *et al.*, 2022). A related consideration, from industry-based studies, is uncertainty over how to implement sustainability strategies and how to integrate sustainability into their business models (Klewitz and Hansen, 2014a; Ozkan, Romagnoli and Rossi, 2023). A further consideration, often overlooked in the emphasis on goals and technical solutions, is the considerable nuances in a local business context and the power dynamics that collectively limit the effectiveness of uptake in sustainability practices (Thomas, Scandurra and Carfora, 2022). On this point, there is also compelling evidence of considerable heterogeneity across SMEs in terms of size, sector, location and formality, and considerable variance in the characteristics of owners, managers and workers (Belyaeva, 2018; Smith *et al.*, 2022).

1.2 Sustainability: Definitional Statements

Sustainability refers to the capacity of a system, whether it be an ecosystem, society, or economy, to endure and thrive over the long term while maintaining the well-being of current and future generations (Giovannoni and Fabietti, 2013). "*Our Common Future*," also known as the Brundtland Report, released in 1987 by the World Commission on Environment and Development, defined sustainability as "development that meets the needs of the present without compromising the ability of future generations to meet their needs" (WCED, 1987). Since then, sustainability has evolved into a multidisciplinary field encompassing interconnected environmental, social, and economic dimensions and the need for a comprehensive approach to a balanced and resilient future is recognised by the UN (Declaration, 2000).

1.2.1 Conceptual Ambiguity

Sustainability and sustainable development, while often used interchangeably, are not synonymous. Rather, their respective meanings can vary by context (Adams, 2006; Bañon Gomis *et al.*, 2011). As well, as Laedre *et al.* (2015) have noted, the terms sustainable business, sustainable technology, sustainable agriculture and sustainable

economics to name some terms are current buzzwords in literature. Adams (2006) suggests a reason for the widespread acceptance of the term sustainable development is its looseness, as it is used to describe divergent ideas. The concept is ‘holistic, attractive, elastic but [also] imprecise’ Adams (2006: 3), and sustainability is prone to value judgements depending on the goals of the assessment (Bond and Morrison-Saunders, 2011).

1.2.2 Sustainability Practices

Sustainability practices include initiatives to reduce environmental impact, and sustainability practices in large corporations relative to small businesses will differ in scale, resources, and organisational structure (Leenders and Chandra, 2013). Typically, large corporations have more influence and resources to implement sustainable sourcing practices and ensure ethical and environmentally friendly supply chains (Batista and Francisco, 2018). The common challenges (and opportunities) according to Mathaisel (2015), include actions to reduce energy consumption and carbon emissions, improve waste management programs, implement ethical labour practices through the supply chain and mitigate environmental degradation, and ensure long-term economic viability. For small businesses, specific examples of sustainability practices include:

- Implementing energy-saving measures such as using energy-efficient lighting, appliances, and equipment to reduce energy consumption and lower operational costs.
- Establishing waste management programs to minimize waste generation.
- Collaborating with suppliers to source materials, reduce transportation emissions, and ensure ethical labour practices throughout the supply chain.
- Supporting local communities through philanthropy, volunteerism, and partnerships with local organisations to address social issues and contribute to community development.

Unlike large corporations, small businesses face challenges in negotiating with suppliers and they have limited resources to trace and verify the sustainability of

materials (Batista and Francisco, 2018). The same dichotomy between large corporations and smaller businesses is evident in power and clean energy (Gholami, Murray and Sands, 2022; Sadiq *et al.*, 2022; Chan, Cheng and Cheng, 2023), in infrastructure development (Younis and Sundarakani, 2020; Khaled, Ali and Mohamed, 2021) and in waste management. Comparatively, corporate (larger) entities have the capacity to invest in and implement large-scale renewable energy and waste reduction projects, while small businesses can struggle to transition to clean energy and adopt basic recycling efforts. Similarly, in skills development and research, larger companies invest in employee training and research for sustainable practices (Chege and Wang, 2020; Sadiq *et al.*, 2022), while small businesses find securing such resources hard (Chien *et al.*, 2021).

Table 2. A Comparative Summary of Sustainability Practices (Source: Ikram et al., 2021)

Corporations	Small Businesses
Raw materials, supply chain, circular/green economy	Green-sourced (localised) materials (use it where you make it)
Power, Energy Infrastructure (low cost, clean & reliable)	Energy efficiency smart appliances
Transportation	EVs, public transport, local supply
Waste management (including EPR)	Reduce, Reuse, and recycle
Green Skills and Research	Digitalization, regulatory, awareness, decarbonisation, certification, green marketing, customers
Financing (Green), investment subsidies	Incentives, government subsidies
Common Considerations	
Circularity, Decoupling, Digital Revolution, Research, Public Support, Regional (bottom-up and hybrid) approaches and data-intensive performance monitoring and reporting (such as Climate Action Trackers and Climate Action Plans),	

Table 2 is a comparative snapshot of the types of sustainability practices for large and small businesses. The practices are often not discrete; they overlap and are sometimes also synergistic. Despite these differences, however, the evolving landscape of sustainability is towards encouraging businesses of all sizes to adopt more responsible practices. Corporations often set the industry standards and smaller enterprises contribute innovation and agility (Khaled, Ali and Mohamed, 2021). Irish SMEs, being under researched offer a valuable opportunity to examine sustainability related innovation.

1.2.3 Measuring Sustainability (The Triple Bottom Line)

The shift towards sustainability in strategy means business performance and success are now measured not only in terms of profit but also in terms of benefits to (impact on) the society and environment. The Triple Bottom Line (TBL) by Elkington (1998) is a pivotal concept in sustainability discourse (Alcamo, 2019). The framework suggests sustainable development requires simultaneous consideration of economic prosperity, social equity, and environmental stewardship (Elkington, 1998) and organisational performance goes beyond traditional financial metrics to also include social and environmental dimensions. These dimensions are also often described by the three “Ps” of People, Planet and Profit (shown in Figure 1).



Figure 1. The Triple Bottom Line (Elkington, 1997)

Mandatory compliance is an important driver in the uptake of sustainability practices (European Commission, 2015). From January 2024, Corporations and listed SMEs are now required to adhere to sustainability regulations outlined in the European Union’s (EU) Corporate Sustainability Reporting Directive (CSRD), and the European Sustainability Reporting Standards (ESRS). The CSRD mandates reporting, a requirement that includes European subsidiaries providing CSRD-compliant data and information. This requirement may present challenges for the currently voluntary Environmental, Social and Governance commitments by small businesses (Ahern, 2023). Study findings in later chapters provide context specific insights on actual

drivers to uptake of practices (Chp 5), presence of innovation and agility (Chp 6) and (un)likely achievement of 2030 carbon emission goals for Ireland (Chp 7).

1.2.4 Corporate Sustainability Reporting Directive (CSRD)

The EU's Corporate Sustainability Reporting Directive (CSRD) is a potential external driver for SME uptake of sustainability practice. The CSRD stems from the climate change objectives of the European Green Deal. It requires company disclosure of climate-related data (European Commission, 2024). While the CSRD currently does not impose a reporting obligation on SMEs (Pouille *et al.*, 2024), and listed SMEs are not directly targeted, it is reasonable to anticipate the need for SMEs to disclose information to larger companies if they are part of the larger business value chain (European Commission, 2023). These standards will in effect support the shift by SMEs towards sustainability (Grewal and Serafeim, 2020), and to prepare for this eventuality, small businesses can access government aids such as the Green Transition Fund and tools like the Climate Toolkit 4 Business to assess environmental impact and devise improvement plans (Pianta and Lucchese, 2020; Sarkki *et al.*, 2022).

Implementing sustainability practices requires an approach that integrates Corporate Social Responsibility (CSR) principles in both Business-to-Business (B2B) and Business-to-Consumer (B2C) communities (Kapitan, Kennedy and Berth, 2019). B2B interactions represent activities where businesses engage with suppliers, partners, and other stakeholders in sourcing, manufacturing, and distribution processes. These upstream activities consequently present an opportunity to leverage change, from some to many. Conversely, B2C interactions such as engaging with consumers to promote sustainable products and behaviours can raise awareness, and support provision to eco-friendly product options, and environmentally responsible choices (Kapitan, Kennedy, and Berth, 2019; Huang, Surface and Zhang, 2022).

CSRD across business communities is an opportunity also to shift from individual aggregated efforts towards collective impact by a focus on necessary innovations in sustainability by B2B, with effects cascading downward into interactions with B2Cs that are less able to bear the time, costs and resource considerations related to sustainability uptake.

1.3 Systematic Literature Review

This section outlines a Systematic Literature Review (SLR) that was conducted early in the research process to explore the various themes and considerations, both internal and external, that could affect the successful uptake of sustainability practices by SMEs. The question that informed the initial search was ‘*What are the opportunities and challenges facing small businesses in relation to sustainability*’. This search was designed to define sustainability and compile recently published literature on the topic in relation to small businesses, then summarise core themes in literature and suggest the next steps to address the challenges noted.

The details of the SLR and evidence of synthesis are provided in Appendix 1. This material was formative in identifying the research need and the literature is not replicated in Chapter 2, which is a focused review of literature related to small business and sustainability constructs, including supporting social theory, in order to form the conceptual framework for this study.

1.3.1 SLR Methodology

The SLR is a systematic and explicit approach that involves collecting, evaluating and using structured procedures to explore the general subject of sustainability practices in SMEs (Paul and Barari, 2022; Sauer and Seuring, 2023). Noting these authors report a diversity of guideline papers, an SLR’s aim is to create a valid map of the currently available research in the reviewed field. A comprehensive search was conducted across major databases such as EBSCO and Web of Science using the keywords - “SMEs”, “sustainability practices”, “adoption”, “barriers to adoption” and “sustainability uptake” to screen and select. A number of articles were recorded for the initial stages, with initial keywords progressively amended to narrow the search to external and internal factors to SME that influenced successful uptake, and “research need”. Inclusion criteria included articles published between 2010 and 2023, with a focus on peer-reviewed journals ranked by the Academic Journal Guide (AJG, previously known as ABS). However, relevant grey literature—such as reports from Enterprise Ireland and the Central Statistics Office of Ireland—was also reviewed (Appendix 8). Exclusion criteria included studies not published in English, and studies situated in developing economies. After screening titles, abstracts, and full texts, relevant data

were extracted on challenges, opportunities, and successful theoretical frameworks. Some ambiguities were noted in the selection criteria, which were revised to further distinguish between methodological approaches, country context and industry. Figure 2 illustrates the screening process.

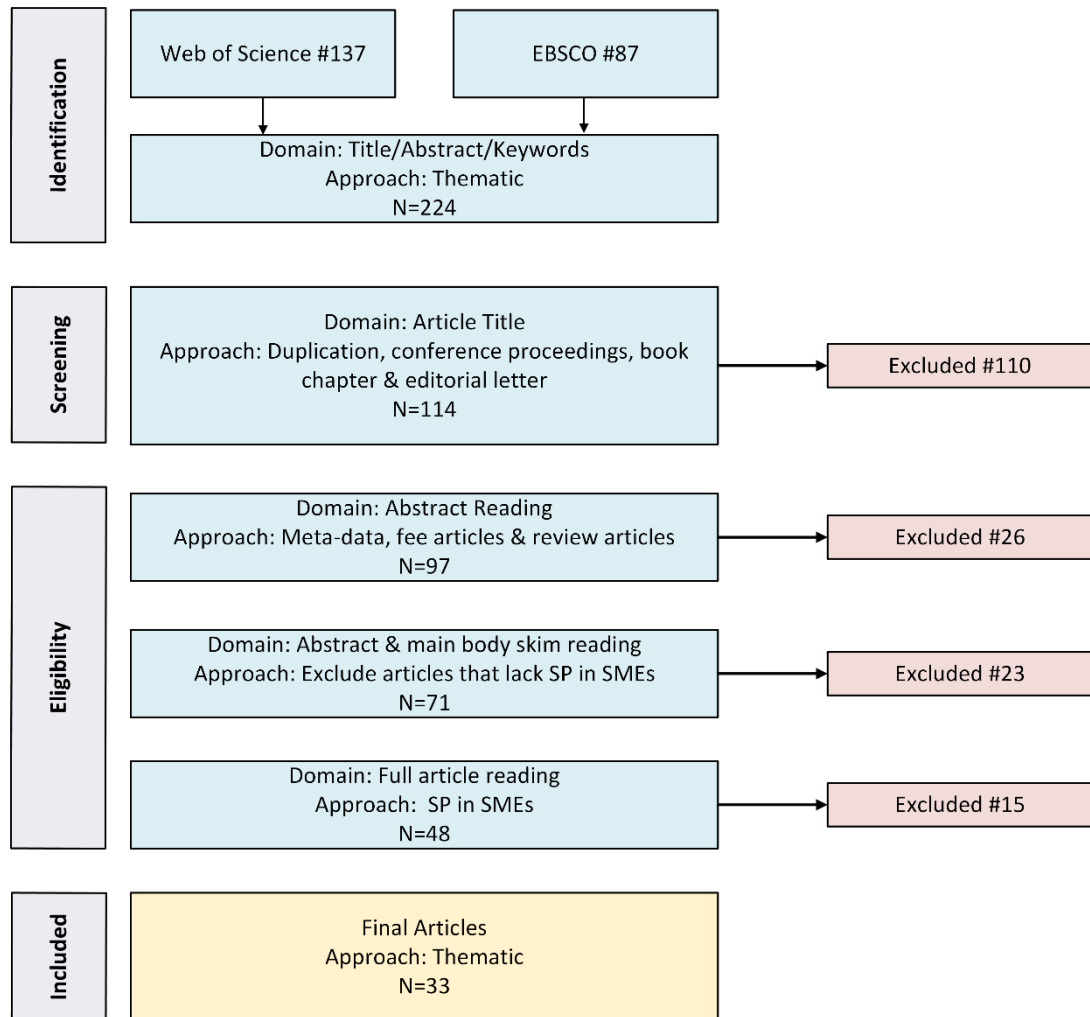


Figure 2. Outline of Data Screening Process (completed in 2022)

As noted by Bowman (2016), an SLR allows the researcher to identify key ideas, challenges, opportunities, and methods used in the field. Consistent with this research, the SLR process helped gather, assess, and synthesise existing research on sustainability practices in SMEs and it helped identify the research question(s) that would guide this study. As Sauer and Seuring (2023) identified, there are six steps to a literature review in management research. The sixth step is reporting results in order to present a theoretical framework in an appropriate journal. For the purpose of this

study, the SLR process stopped at step 5 (synthesis of the literature) which identified challenges and opportunities (see Table 3).

1.3.2 SLR Results: Challenges and Opportunities

The selected dataset from the Systematic Literature Review SLR that was conducted at the start of the study is at **Appendix 1**. Table 3 is a summary of challenges and opportunities noted in the literature that were used to identify the research need(s) and subsequent research questions (RQs).

Table 3. Summary of Challenges and Opportunities

Theme	Challenges	Opportunities	References
Research gap/ need	The work by SMEs, in contrast to larger corporations, in their journey towards sustainability, remains comparatively underexplored.	Considerable research opportunities	Gaganis, Pasiouras and Voulgari, 2019; Prasanna et al., 2019; Gholami, Murray and Sands, 2022; Ozkan, Romagnoli and Rossi, 2023.
Interdependencies	EU's target to be carbon neutral by 2050 is not achievable unless larger companies include SMEs in their supply chain \ carbon reduction programmes.	Larger companies to include B2B SMEs in their supply chain \ carbon reduction programmes.	Dey, Chrisovaladis Malesios, et al., 2022. Davis et al., 2009 Sohns et al., 2023)
Financial Constraints	Lack of financial resources to invest in sustainable tech and products	Sustainability can lead to long-term cost savings through energy efficiency & resource optimisation.	(Walker, Di Sisto and McBain, 2008; Abbasi and Nilsson, 2012; Giunipero, Hooker and Denslow, 2012)
Lack of Expertise and Knowledge	SMEs often do not have access to the necessary knowledge and expertise to implement sustainability practices.	Engaging in sustainability can foster innovation and provide learning opportunities for growth.	(Álvarez Jaramillo, Zartha Sossa and Orozco Mendoza, 2019; Johnson and Schaltegger, 2020; Durrani et al., 2024)
Regulatory Barriers	Complex and evolving regulations can overwhelm SMEs leading to compliance issues.	Government policies may offer tax rebates	(Caldera, Desha and Dawes, 2019; Cantele and Zardini, 2020)
Short-Term Focus	SMEs prioritise immediate profitability	Sustainability initiatives can lead	(Klewitz and Hansen, 2014b;

	over long-term sustainability due to survival needs.	to competitive advantage and improve customer satisfaction.	Manzaneque-Lizano, Alfaro-Cortes and Priego de la Cruz, 2019)
Customer Demand	Limited demand from the customer can hinder the uptake of sustainability practices.	Increasing customer interest in sustainability presents opportunities for differentiation.	(Adebanjo, Teh and Ahmed, 2016; Ernst et al., 2022; Madrid-Guijarro and Duréndez, 2024)
Cultural Mindset	Resistance to change or viewing sustainability as a non-essential business function.	Prosocial actions can improve brand reputation and attract eco-conscious customers.	(Felício, Meidutė and Kyvik, 2016; Kiefhaber, Pavlovich and Spraul, 2020; Kraus et al., 2020)
Cost Savings	Initial costs are high	Over time, this can lead to reduced operating costs & greater efficiency	(Masurel, 2007; Prashar, 2019; Bartolacci, Caputo and Soverchia, 2020)
Collaboration	SMEs may lack the networks to form partnerships that support sustainability initiatives.	Support networks, resources and collaborations with partners. Market expansion opportunities. The collective potential of SMEs as environmental agents	(Smith, Kistruck and Cannatelli, 2016; Journeault, Perron and Vallières, 2021; Smith et al., 2022)
Business Innovation	Risk aversion, resource scarcity, financial constraints, regulations	Larger corporations often set industry standards and smaller enterprises contribute innovation and agility in the journey towards sustainability	(Khaled, Ali and Mohamed, 2021; Bajada et al., 2022)
Enablers of Innovation	Leadership, Culture, clusters, networks, emerging knowledge	Innovation ecosystem R&D in innovative technologies	(Klewitz and Hansen, 2014b; Caldera, Desha and Dawes, 2019; Chege and Wang, 2020; Moursellas et al., 2023)
Brand Reputation	SMEs may not initially see tangible benefits from improving sustainability.	Enhanced reputation can attract investment and foster customer loyalty.	(Oxborrow and Brindley, 2013; López-Pérez, Melero and Javier Sese, 2017)

Cultural Influences	SMEs exhibit “organised hypocrisy” by making sustainability commitments without aligning internal operations.	SMEs are embedded in local communities, hence prosocial behaviours foster trust and strong relationships, facilitating localised sustainability.	(Felício, Meidutė and Kyvik, 2016; Porfírio, Carrilho and Mónico, 2016; Kraus et al., 2020)
Resources (infrastructure)	Inadequate infrastructure and costs	SMEs can leverage local networks and adopt agile, cost-effective systems like automated management and reporting systems	(Ghadge et al., 2017; Álvarez Jaramillo, Zartha Sossa and Orozco Mendoza, 2019)
Leadership	Business owners often handle all the decisions but may lack the expertise, time, or strategic planning skills for long-term sustainability initiatives.	Limited understanding of what (behavioural) mechanisms strengthen SME management and entrepreneurial capabilities.	World Bank Group, 2019 (Kerr, 2006; Swaab et al., 2014; Asad et al., 2021; Suriyankietkaew, Krittayaruangroj and Iamsawan, 2022)
Strategy planning	Corporations adjust their strategies and practices based on the perceived significance of material versus personal outcomes	What can encourage growth in productivity and employment, as well as sustainability? Disparities between material & personal outcomes to engender behavioural transformations	(Kelley et al., 2003a; Moore and Manring, 2009; Swaab et al., 2014; Raveendran, Silvestri and Gulati, 2020)
Measuring / Reporting	Complex sustainability reporting requirements can overwhelm SMEs, who often lack the resources and staff to manage them	Simplified reporting systems and third-party sustainability certifications can provide SMEs with scalable, manageable frameworks for tracking and communicating progress.	(GRI, 2022; Dinh, Husmann and Melloni, 2023; Poulle et al., 2024)

Key challenges facing SMEs in the adoption of sustainability practices in relevant literature were noted. These include financial (cost) constraints, lack of expertise, complex regulations, and customer demand for sustainable products. SMEs struggle with the cost of adopting sustainable technologies, due to knowledge/skill gaps, as well as a predominant short-term business focus, and limited resources (time) to ensure compliance with regulations. There is also some resistance to change and business owners even see sustainability as a non-essential business function.

In contrast to challenges, there were considerable opportunities noted that present potential benefits in terms of successful productivity and best-practice improvements. These opportunities include collaboration with other firms and NGOs for improved competitive advantage, as well as long-term cost savings from energy efficiency, and related service and product innovation. As well, sustainability practices in terms of (green) supply chains and waste management also enhance brand reputation, improve customer satisfaction, provide access to new markets and better employee engagement. Other opportunities highlighted includes the chance to leverage local networks, use simplified reporting systems, and grasp incentives like grants and tax breaks to improve sustainability efforts. Confronting cultural barriers to change and seeing sustainability as an essential business function, can further unlock opportunities for innovation, and improve productivity and uptake within local communities.

Finally, as also noted in Table 3, challenges can offer opportunities. Viewing supply chains as a network, partnership and vendor diversity, as well as strong relationships with suppliers and customers are all useful strategies. Similarly, noting the structure of situations can shape behaviour above and beyond the goals of interacting individuals, structures also present opportunities for collective impact (Davis, Green and Reed, 2009). From a perspective of interdependence, while individuals may often be tempted to act on immediate self-interest, in a process termed pro-relationship transformation of motivation, actual behaviour can instead be guided by what is best for the well-being of the environment. This is similar to prosocial actions that can be proactive (for a perceived benefit), reactive (towards a perceived need) or altruistic (Jung *et al.*, 2020).

1.4 Research Problem

As noted earlier, considerable attention has been directed toward large corporations in the implementation of the 2030 Agenda and the SDGs (see Lee and Klassen, 2008; Carpentier and Braun, 2020; Smith et al., 2022). The work by SMEs, in contrast, in their journey towards sustainability remains comparatively underexplored (Gaganis, Pasiouras and Voulgari, 2019; Prasanna *et al.*, 2019; Gholami, Murray and Sands, 2022; Ozkan, Romagnoli and Rossi, 2023). Irish SMEs are under researched and consequently are a valuable opportunity to examine the potential for scalable impact, as well as facilitating the anticipated innovation and agility (Khaled, Ali and Mohamed, 2021) associated with SMEs.

This research seeks to bridge this gap by:

- First, examining internal structures, such as owner beliefs, awareness and intentions about sustainability practices (RQ1), such as achieving carbon neutrality, implementing energy efficient measures, reducing waste, shifting to green supply chains, socially responsible marketing, and community engagement (Nygaard, Kokholm and Huulgaard, 2022; Smith *et al.*, 2022).
- Second, in a follow-up question, (RQ2), study the behaviour of Irish SME owners as an outcome or consequence of the environment and structural situation. While a few studies have focused on the sustainability potential of European SMEs (Clement and Hansen, 2003; Falle *et al.*, 2016; Moursellas *et al.*, 2023), there is a gap in empirical research on Irish SMEs. Theoretical insights from interdependence theory (Kelley et al., 2003; Raveendran, Silvestri and Gulati 2020) arguably may help identify material and personal outcomes that drive necessary behavioural shifts.
- Finally, the study seeks to empower policymakers and small business owners alike with evidence-based insights that can support targeted strategies and behavioural mechanisms to enhance the uptake of sustainability practices within SMEs. The context for this research is the need to adhere to sustainability regulations outlined in the European Union's (EU) Corporate Sustainability Reporting Directive (CSRD). What is the state of play in Irish SMEs, given literature suggests this requirement may present challenges for

the current voluntary Environmental, Social and Governance commitments by small businesses in the EU and so too in Ireland (Ahern, 2023).

The motivation behind this research is based on the recognition of the pivotal role SMEs play in the global economy and their potential as catalysts for sustainable development (H. Smith et al., 2022). As noted earlier, much of the existing research focuses on large corporations in the context of sustainability (Prasanna et al., 2019). While valuable insights have been gained from these studies, SMEs present a different set of challenges and represent opportunities that require tailored investigations. By addressing this gap, this research broadens the understanding of sustainability practices in the SME sector.

1.4.1 The Sustainability Challenge

The “Sustainability Challenge” facing Irish SMEs is illustrated by a ‘black box’ (see Figure 3) in terms of awareness, intentions and actions, including metrics for possible evaluation, in relation to carbon neutrality but also other wider sustainability objectives. Literature points to a lack of transparency and understanding of how collaborative and transformative efforts can impact the achievement of Sustainable Development Goals (SDGs) - see (Sachs *et al.*, 2019; Dey, Chrysovalantis Malesios, *et al.*, 2022), particularly those led by the private sector and small businesses (Camuffo *et al.*, 2020). What is clear, however, is that to address the many evident challenges, collaboration is essential between States, the private sector and civil society (Vazquez-Brust *et al.*, 2020) and that businesses including SMEs are vital to ensuring supply chains are sustainable and environmentally responsible (Sohns *et al.*, 2023).

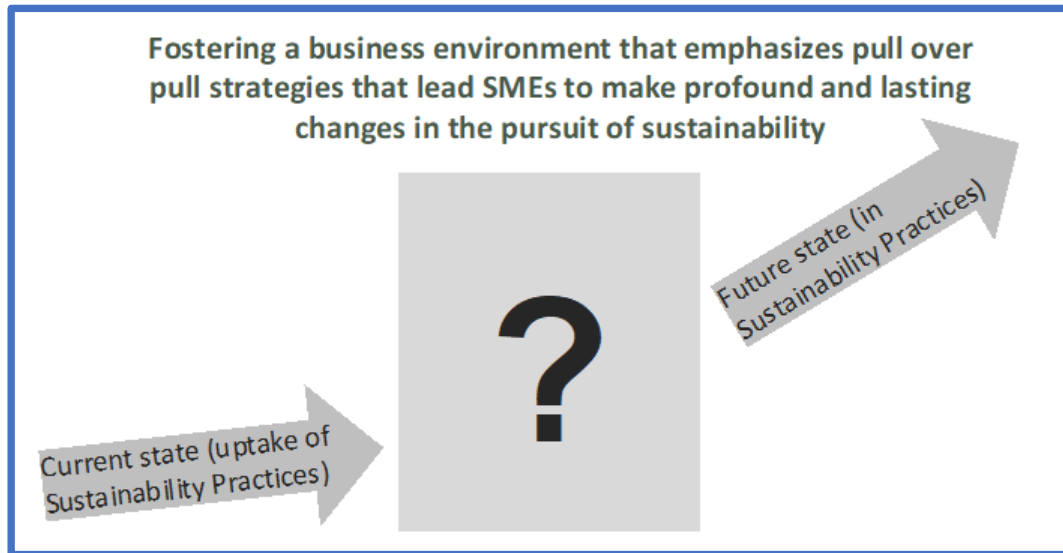


Figure 3. The Sustainability Challenge

In terms of addressing the challenge of the uptake of sustainability practices by SMEs, it is crucial to consider the contextual realities involved. Transitioning from traditional practices such as energy sources like coal, oil, and natural gas requires convincing both consumers and policymakers, a task that is beyond SMEs with limited resources and reach (Marrero, 2010). Yet, as Deyris (2023) says, ‘People and governments must be convinced to do this to mitigate climate change’. The sustainability challenge in Figure 3 is summarised as having:

- A demand-side issue (need for energy, food, travel, and heating).
- A supply side issue of clean and reliable energy generation and managing consequences of industry and humanity (waste, resource depletion, aspiration of developing world).
- And the consequent internal and external challenge of SMEs meeting their immediate (survival) needs and yet ensuring business operations, including their supply chains are sustainable and environmentally responsible (Sohns *et al.*, 2023)-

1.4.2 External Drivers

There are four external drivers that significantly influence the sustainability landscape. First, the absence of a standardized matrix for measuring the impact of sustainability practices poses a fundamental challenge. SMEs often struggle to assess the

effectiveness of their sustainability initiatives without universally accepted metrics and benchmarks (Smith *et al.*, 2022; Argyrou, Chevrolier and Nijhof, 2023). Second, evaluating the effectiveness of sustainability efforts by SMEs is not helped by a lack of clear guidelines and best practices (Isensee *et al.*, 2020). Moreover, the diversity of SMEs and their operational contexts makes a one-size-fits-all approach impractical (Carayannis *et al.*, 2020; Chan, Cheng and Cheng, 2023). An additional third external factor is regulatory considerations. SMEs must navigate a web of evolving environmental and social regulations, which can be both time-consuming and costly (Bennett *et al.*, 2018).

A fourth and final factor is the absence of clear guidelines on decarbonisation policies that hinders SMEs' ability to transition to low-carbon operations, further compounded by varying regional priorities (López-Mosquera, García and Barrena, 2014). These external drivers collectively underscore the imperative for SMEs to develop strategies that consider sustainability as a core component of their business operations.

1.4.3 Internal Constraints

SMEs encounter a range of internal constraints as well that pose significant challenges to their adoption of sustainability practices. These challenges encompass issues such as a lack of awareness, knowledge deficits, limited resources, absence of strategic planning, informal organisational cultures, and inadequate transparency. Insufficient awareness among SMEs about the benefits and importance of sustainability can hamper commitment to sustainable initiatives (Silva *et al.*, 2021; Sohns *et al.*, 2023), while a lack of specific knowledge and expertise required for sustainable practices can hinder effective implementation (Sajjad, Eweje and Tappin, 2020). Moreover, with limited financial and human resources compared to larger corporations, SMEs face difficulties in terms of marshalling assets for sustainability efforts (Johnstone, 2020).

Another internal constraint is the absence of strategic planning, which can result in ad-hoc or inconsistent practices (Ho, Wang and Vitell, 2012; Zameer, Wang and Yasmeen, 2020; Wang, Chu and Hao, 2024). Another internal constraint noted is informal organisational cultures that may resist change and buy-in from employees (Raj and Srivastava, 2013; Gaganis, Pasiouras and Voulgari, 2019). Additionally, the

lack of internal and external transparency can further impede progress (Osano and Languitone, 2016; Gupta *et al.*, 2022). These internal challenges collectively present challenges but also opportunity for SMEs seeking to adopt sustainability practices. Figure 4 summarises the external and internal factors and the research need.

1.4.4 Research Need

Figure 4 highlights research gaps noted in the SLR in relation to the implementation and impact of sustainability practices in SMEs. SMEs are frequently caught between external drivers—such as government mandates or market pressures, and internal constraints like limited awareness, resources, and strategic planning (Peron and Vallieres, 2021; Bakos, Orengo & Kasiri, 2020). Moreover, internal constraints are further handicapped by the absence of clear regulatory guidelines and governmental support (Frigon, Doloreux, & Shearmur, 2020), thus making it difficult for SMEs to align their operations with broader sustainability goals.



Figure 4. Research Need

The need for government support and simplified systems highlights the importance of tailored frameworks (one-size does not fit all) that can aid SMEs in overcoming these challenges. Another important gap identified is the lack of research on the primary drivers for sustainability adoption within SMEs (Siegal et al., 2019). While some SMEs are motivated by cost savings and customer demand, others may be driven by external incentives, such as government grants or tax breaks.

Understanding these motivators is essential for designing policies that effectively encourage SMEs to adopt sustainable practices.

Additionally, the challenges and opportunities related to adopting sustainability practices by SMEs (Jarmillo, Sossa & Mendoza, 2019) point to another significant research need. Opportunities, such as fostering innovation, improving brand reputation, and engaging with local networks, are well documented, but there is a dearth of empirical research exploring how SMEs can capitalize on these opportunities. Conversely, challenges like “organised hypocrisy”, where SMEs may publicly commit to sustainability without making meaningful internal changes (Brunsson, 1989), need further exploration to understand how such gaps between rhetoric and practice can be addressed. As the research on decarbonisation policies, internal constraints, and primary adoption drivers remains limited, it is essential to explore the interconnectedness of these factors to provide a clearer roadmap for supporting SMEs in their sustainability journey.

1.5 Study Aim

The study's aim is to develop a better understanding of the awareness of sustainability and associated practices by SME owners and to extend this understanding towards activating the collective potential of small businesses as environmental agents that research suggests could be powerful (Smith *et al.*, 2022). Aside from well-designed business development service (BDS) programs that offer non-financial services to entrepreneurs at various stages of their businesses, there is a limited understanding of what (behavioural) mechanisms strengthen SME management and entrepreneurial capabilities (Abu-Rumman *et al.*, 2021; Fan *et al.*, 2021) .

What can encourage growth in productivity and employment, as well as sustainability (Sheppard, 2023; Wales *et al.*, 2023)? The study by Sheppard (2023) found, for example, that the relationship between entrepreneurial orientation (EO) and growth is mediated by innovation performance, a behavioural measure of innovation. Similarly, if a business goal is uptake of sustainability practices, it will need to focus its limited resources using a strategy appropriate for such growth. What are some actions that can serve the needs of SMEs and in which contexts.

Importantly, as Westman et al. (2019) also suggest, there is a need to question associated assumptions. For example, as McAdam (2000) highlights in relation to the application of quality and business excellence models in the public sector and in small business, there is a need to question the implicit assumption that total quality management (TQM) principles are sufficiently generic to apply to both large and small businesses. Conversely, at a practical level, the reality is that the EU's target to become carbon neutral by 2050 is not achievable unless larger companies include SMEs in their supply chain \ carbon reduction programmes (Dey, Chrisovaladis Malesios, *et al.*, 2022). Reflecting on this reality, as these authors conclude, there is evident opportunity and need for good research in this subject area.

1.5.1 Research Questions and Objectives

Two research questions (RQs) are identified. RQ1 is as follows: *What factors influence the adoption of sustainability practices in SMEs?*

This RQ examines the determinants that shape SMEs' adoption of sustainability practices in Ireland. Three subordinate research objectives (ROs) have been formulated:

- RO1: What are the actor-specific characteristics that influence the implementation of sustainability practices in SMEs?
- RO2: What are the organisational characteristics that influence the implementation of sustainability practices in SMEs?
- RO3: What are the structural dynamics that influence the implementation of sustainability practices in SMEs?

RQ2 is as follows: *What actor and environmental factors influence sustainability practice behaviour in Irish SMEs?*

Knowing that structure reliably influences behaviour (Van Lange et al., 2015), this RQ seeks to extend this understanding of structural and environmental interdependencies in order to activate the collective potential of small businesses as environmental agents that research suggests could be powerful (Smith et al., 2022).

- RO4: What actor vs environmental characteristics influence behaviour?

- RO5: Identify a framework to support sustainability practices in Irish SMEs.

1.5.2 Justification and Significance

The significance of the SME sector in bolstering the economic competitiveness of nations is widely acknowledged in academic literature (Parker, Redmond and Simpson, 2009; Muhammad *et al.*, 2010; Du and Banwo, 2015). SMEs in Ireland similarly make a significant contribution to national economic development and growth. However, they also have a substantial environmental footprint (Gurău and Dana, 2018). Given their significant numbers and their collective environmental impact, notwithstanding concerns over business survival, sustainability practice uptake is essential if Ireland is to achieve its national carbon emissions targets and related goals based on the 2030 UN sustainability agenda (Lozano, 2008; Holmberg and Sandbrook, 2019; Carpentier and Braun, 2020). Moreover, noting the heterogeneity of SMEs, a one-size-fits-all approach to sustainability is impractical. Sustainability uptake will require tailored solutions for the specific needs of the country (Smith *et al.*, 2022) based on both national policy initiatives and local, adaptive strategies (Bellamy *et al.*, 2001; Biesbroek *et al.*, 2010).

Sustainability implementation strategies must also consider local context, especially in regions with limited resources and infrastructure (Andersson, Dickin and Rosemarin, 2016). Conversely, as SMEs are closely tied to their communities and sensitive also to public scrutiny (Leckel, Veilleux and Dana, 2020), they are also well suited to driving change and helping communities access the potential benefits of sustainability (Beckmann, Garkisch and Zeyen, 2023). As an example, SMEs can support grassroots organisations to increase public awareness and participation in sustainable development initiatives (Hariram *et al.*, 2023).

1.6 Study Approach

The focus of this study is SMEs in Ireland, with analysis based on a representative sample across sectors and regions. The environment in Ireland is a highly challenging one characterised by high energy costs, inflation and labour costs has resulted in many small businesses struggling. Reflecting these considerations there is apparent intention by the Irish government to raise awareness, but also not enforce sustainability

(intentional ambiguity) as a regulatory requirement (Small Firms Association, 2024). This ambiguity in the regulatory environment is replicated in the EU environment (European Union, 2022). Even so, sustainability is more than simply a compliance issue, and successful uptake reflects an interdependence on good governance and decision-making that are prerequisites for progress (Keser 2023). The methodological rationale behind the study can be found in Chapter 4. As this study seeks to enable a richer understanding of small business awareness and uptake of sustainability practices, a sequential mixed method approach is deemed appropriate (see Figure 5), using both surveys, interviews and secondary data (business cases).

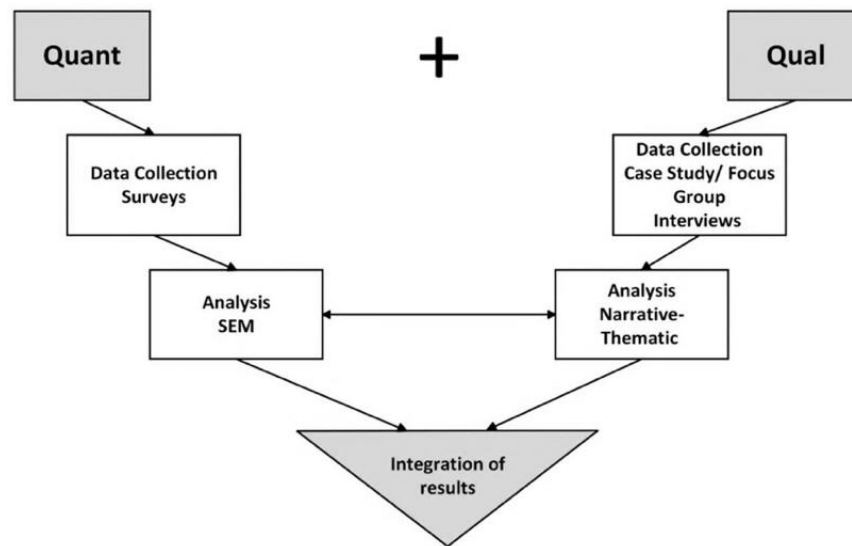


Figure 5. Research Design Sequential Mixed Methods

1.7 Study Contribution (Anticipated)

There is a growing thread of research on sustainability practices by SMEs, but only isolated studies of uptake by Irish SMEs (Isensee et al., 2020; Johnstone, 2020; Hummels and Argyrou, 2021; Journeault, Perron and Vallières, 2021; Patterson, Singh, and Cho, 2022; Argyrou, Chevrollier and Nijhof, 2023; Chan, Cheng, and Cheng, 2023). From a theoretical standpoint, the Theory of Planned Behaviour (TPB) (Ajzen, 1985) enables a quantitative investigation of how attitudes, subjected norms, and perceived behaviour control of business owners influence their willingness to implement sustainable practices. The study then uses the Interdependence Theory (Thibaut and Kelley, 1959; Kelley, 1978) supported by social capital theory (Clark,

2015), strong structuration theory (Giddens, 1984; Stones and Jack, 2016) and entrepreneurial orientation (Sarasvathy *et al.*, 2010) to explore RQ 2 that is concerned with situational factors that can shape behaviour. This qualitative approach allows for a deeper understanding of the dynamic relationship between the external environment, individual agency, and structural influences on the uptake of sustainability practices.

Two quality-related models are highlighted for the later development of grounded models on SME sustainability. The first model is the Business Excellence Model (BEM), which assumes a causal link between enablers and results, and the second is the Balanced Scorecard (see Kaplan and Norton, 2005) that identifies four dynamically linked quadrants, each reflecting different goals, measures and improvement activities (McAdam 2000). Both models have been applied in large organisations, and this study will seek to adapt the models for the small business context. For example, while planning periods of one, three and five-year business plans are unrealistic timescales for SMEs (Ahire, Golhar and Waller, 1996), in a small business environment strategy formulation is a more dynamic process. Conversely, being in close proximity to the customer, SMEs are described as being able to incorporate customer needs without formalised approaches that divert scarce resources and add bureaucracy.

Commonly, leadership, which is a key enabler and determinant of success in the BEM and BS, is also important in an SME environment (Gunasekaran *et al.*, 1996). Notably, as related literature suggests, small business managers often lack the expertise and training (Yeb-Yun Lin, 1999), and they have little available spare time (Hale and Cragg, 1996). Consequently, leadership can be more rhetoric than actual substance according to McAdam (2000). Nonetheless, research based on these (BEM and BS) models helps reveal some useful insights in the context of implementing sustainability. For example, SMEs, being informal, flatter and less centralised structures are more able to implement change (Hale and Cragg, 1996). Similarly, team-based processes offer more opportunities in SMEs that are characterised by informal and cross-functional working styles. As well, Gunasekaran *et al.* (1996) highlight the wider focus by strategy as enabling SMEs to become more effective, though this wider perspective is challenging and not for SMEs that are ‘marking time’ or expecting immediate significant effects on financial indicators (McAdam, 2000).

Arguably, the grounded model framework we propose will fill a void as there are currently no analogous frameworks for hard-to-quantify sustainability practices and for the design of evaluation and monitoring strategies geared for SMEs in regional or local contexts. The simplified four-quadrant framework that completes this study thus serves as a theoretical contribution in several ways. First, it enables further grounded studies to be carried out to check the scope of the categories and factors and so build on the robustness and validity of the model (Eisenhardt, 1989). Second, the grounded model framework supports later hypothesis testing to understand the correlation between economic, environmental and social categories, and dynamics in uptake by small businesses. Third, the study contributes to the scholarly discourse on organisational behaviour and strategic management and change, and SMEs can use the model to optimise change implementation.

1.8 Thesis Structure

The thesis structure is presented visually in Figure 6. There are three broad components as illustrated on the left of the image: General Introduction (Chapter 1), followed by the theoretical and conceptual framework, as well as hypotheses development and research methodology (Chapters 2, 3 and 4). Finally, the thesis presents the findings and discussion related to, in order, the quantitative analysis (RQ1 – Chapter 5) and then the qualitative analysis (RQ2 – Chapter 6), followed by a study synthesis and conclusion (Chapter 7).

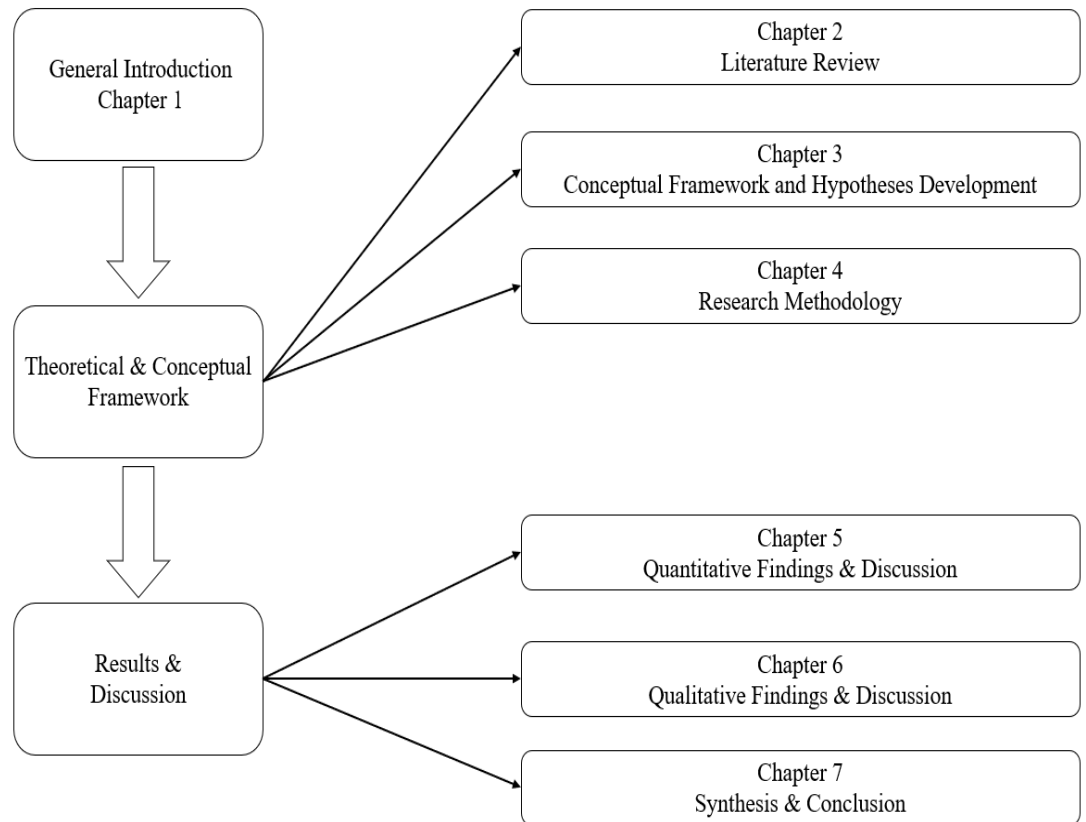


Figure 6. Thesis Structure

The structure of this thesis are as follows:

Chapter One introduces the key concepts of this study and an overview of the study aim, research question(s) and research objectives as well as a description of the methodological approach used in this study. The chapter then outlines the anticipated contribution to research and its implication for future academic inquiry and managerial practice.

Chapter Two presents literature related to sustainability and sustainable development, and the major theoretical areas relevant to the study. It closes with an in-depth analysis of related theory and presents the conceptual framework used in the study.

Chapter Three develops the hypotheses and refines the conceptual framework in relation to RQ1, the quantitative element of this study.

Chapter Four presents the research philosophy and the methodology, highlighting the reliability and validity of the chosen method. The research design, methods and process are also described, followed by a discussion on data collection, sampling techniques, data analysis methods, and a brief comment on research ethics.

Chapter Five presents the analysis of quantitative findings. It examines and answers the research hypotheses offering insights on what the data reveals.

Chapter Six presents the analysis of qualitative findings from the literature as well as the interviews. The chapter outlines the storylines (narratives) of business owners/managers of SMEs. These narratives then form the basis of a thematic analysis.

Chapter Seven presents the conclusion, study's contribution, implication, limitations, and directions for future research areas.

1.9 Chapter One Summary

The chapter identifies the significant role played by SMEs worldwide and on the upside their adaptability, innovation and potential to contribute to sustainability. The chapter also flags the underlying motivation for this research, which stems from the observed gap in the literature related to sustainability and SMEs. Next, the chapter presented the research questions and objectives. Two RQs are noted, the first, concerned with the factors influencing awareness and intention to take up sustainability in SMEs and the second, which examines the decision interdependencies between the many considerations related to these practices.

The chapter then highlighted the need to explore sustainability by SMEs in Ireland, which represent over 98% of businesses and are the major employers in the country. Acknowledging limitations associated with data availability and participation, the intention is to use a mixed-method approach to establish a conceptual framework to support SMEs uptake of sustainability practices in the Irish context.

Chapter 2: Literature Review

2.1 Introduction

The study aim is to develop *a better understanding of the awareness of sustainability and associated practices by SME owners and to extend this understanding towards activating the collective potential of small businesses as environmental agents*. chapter outlines key concepts and theoretical perspectives from the literature that underpin the research on sustainability practices within Irish SMEs. This chapter outlines the key definitions, foundational theories, rules and regulations regarding sustainability practices discussed in the literature. The chapter provides an overview of the extant literature related to the challenges and opportunities related to the uptake of sustainability practices by SMEs. Finally, the chapter concludes with a discussion of the conceptual framework adopted in this study.

2.2 Sustainability: Definition and Concept

Sustainability is a multifaceted and evolving concept that has gained prominence in academic discourse and policy discussions. The seminal report "Our Common Future," also known as the Brundtland Report, released by the World Commission on Environment and Development in 1987, played a pivotal role in defining sustainability as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). Since then, sustainability has evolved into a multidisciplinary field encompassing environmental, social, and economic dimensions, emphasising the interconnectedness of these facets and the importance of a comprehensive approach to achieving a balanced and resilient future (UN, 2015). As the urgency of global challenges continues to grow, sustainability and sustainable development remain a crucial framework for guiding human actions and policies toward a more equitable and environmentally responsible world (Alvarado-Herrera *et al.*, 2017b).

A pivotal driver of environmental consciousness is mandatory compliance with legislation (European Commission, 2015). Legislation serves as the bridge between an organisation's profit-oriented goals and the broader interests of society (Williams

and Schaefer, 2013a). Proficient management of environmental compliance can augment a business's overall value (Hasan *et al.*, 2019). In developing nations, regulations may constitute the sole impetus within a company for enhancing its environmental performance (Fernández-Viñé, Gómez-Navarro and Capuz-Rizo, 2010). Businesses operating within EU member states are bound by a spectrum of environmental regulations, with 14 member countries having developed action plans on corporate responsibility. Ireland introduced its inaugural National Action Plan on Corporate Responsibility in 2014 (Burke, 2015). The government envisions Ireland as a Centre of Excellence for responsible and sustainable business practices (Department of Jobs, Enterprise, and Innovation, 2014). This vision may have ramifications for Small and Medium Enterprises (SMEs) in Ireland, as sustainability is increasingly acknowledged as a pivotal factor in ensuring competitiveness.

2.2.1 Sustainable Innovation and their Paradoxes

Sustainable Innovation is described as representing transformative potential in the contemporary business landscape (Tuckerman *et al.*, 2023). As organisations try to address pressing global challenges such as climate change, resource depletion and social inequalities, the pursuit of sustainable innovation becomes a strategic imperative. However, within the realm of sustainable innovation, a complex interplay of paradoxes emerges. For one thing, innovation can contribute to inequalities (Zeng, Hu and Ouyang, 2017), another fact is that they can have negative environmental costs (Hahn and Pinkse, 2022). Balancing economic viability with environmental and social considerations, navigating short-term goals against long-term sustainability, and fostering innovation while minimizing ecological impact are some of the paradoxes that organisations encounter. As Tuckerman et al. (2023) adds, however, social and environmental paradigms are underrepresented in innovation policy dominated by the economic paradigm.

Any approach to sustainability (see Figure 7) must accept the competing tensions between economic, environmental and social concerns that reside at different levels and operate at different temporal and spatial scales (Elia, Margherita and Petti, 2020). In effect, firms and decision-makers must accept and live with these tensions, often in the absence of immediate business benefits (Rivoli and Waddock, 2011) or often by engaging with fringe stakeholders with little or no direct business relevance

(Thacker *et al.*, 2019). Yet, facing these paradoxes in sustainability goals does not mean firms abandon profit (Yang and Cui, 2019). Rather, what is needed is “simultaneous attention ...over time” (Smith and Lewis, 2011 pp. 392).

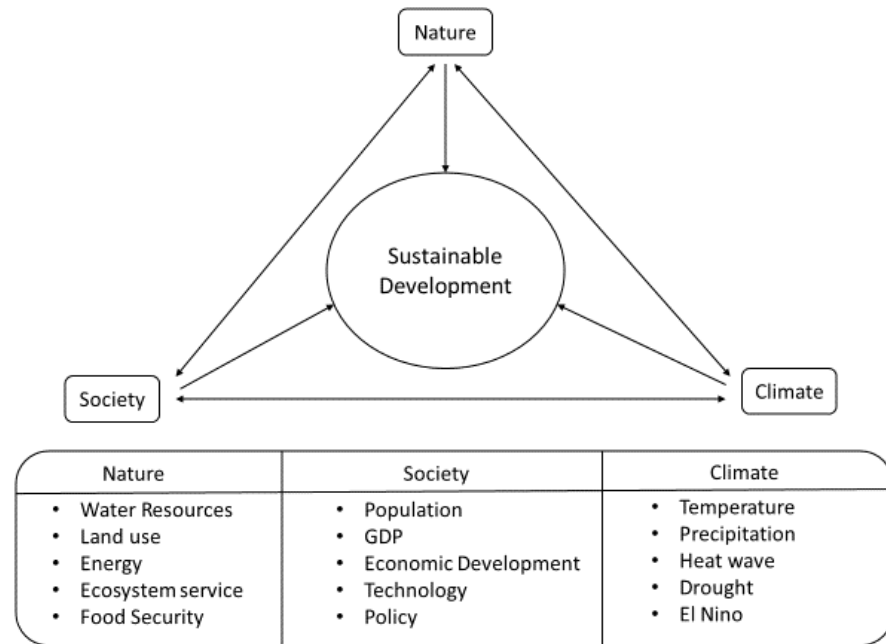


Figure 7. Sustainable Development (Yang & Cui, 2019)

2.2.2 Interconnections

Tukker (2015) illustrated the notion of interconnection as a focus on resource efficiency and circular practices that can reduce the environmental footprint associated with resource extraction and production. Understanding the SDG Agenda was conceived to be integrated and indivisible (Fronza *et al.*, 2023), and the sustainable development goals (SDGs) are conceived as interdependent and interlinked by design. That said, given the complex network of interconnections, the reality also is that these interconnections can be positive (synergistic), negative (regressive) or have a mixed nature (conflictual), and these interconnections can happen at different geographical and temporal scales with different impact. An analysis of the state of the art on SDG Interlinkages and an update of the JRC tool to foster policy coherence for sustainable development in EU policymaking is available in Fronza, V., Barbero Vignola, G., Borchardt, S. *et al.*, *Uncovering SDG Interlinkages: interconnection at the core of the*

2030 Agenda.¹ This report provides a consideration of the type of methods used to identify interlinkages, the geographical and temporal scales, the sign of interaction (positive, negative, or mixed), the direction of interaction, its strength and description.

2.2.3 Operationalising Sustainability

The operationalisation of sustainability is described as confronting a myriad of challenges on its path towards implementation (Deryckere and Gauthier, 2018). One of the foremost challenges is in the familiar need to reconcile short-term economic imperatives with long-term environmental and social goals (Bonfanti *et al.*, 2023; Florek-Paszkowska and Hoyos-Vallejo, 2023). The often-myopic focus on immediate profits and shareholder returns can hinder the adoption of sustainable practices that yield benefits over a more extended timeframe (Erzurumlu *et al.*, 2023). Resource limitations, both in terms of financial and natural resources, pose another significant obstacle (Sharma *et al.*, 2022; Bahuguna, Srivastava and Tiwari, 2023)

A further consideration in the transition to sustainable technologies and practices is the substantial upfront investments, which can be daunting for businesses and governments, while policy and regulatory frameworks, while crucial for fostering sustainability, can sometimes create conflicting incentives or lack the necessary enforcement mechanisms to drive compliance (Nogueira, Gomes and Lopes, 2023; Bonfanti *et al.*, 2024). Moreover, addressing disparities in economic development and access to resources across regions poses a formidable challenge, as a one-size-fits-all approach may not be suitable for diverse contexts (Castellani *et al.*, 2023; Kafetzopoulos, 2023) and the delicate balance between economic, social, and environmental considerations, requires visionary leadership, innovative solutions, and a collective commitment to achieve a more sustainable future (Dijkstra-Silva, Schaltegger and Beske-Janssen, 2022; Bonfanti *et al.*, 2023).

¹ Publications Office of the European Union, 2023, <https://data.europa.eu/doi/10.2760/711960>

Importantly, based on a literature review of innovations in SDGs and more generally of sustainability in an industrial context, Cordova and Celone (2019) noted some instructive preliminary results. Common to related literature, some SDGs appear more as a prerequisite for achieving targets, than actual goals, with multiple actors involved, while innovation has proven to be a driver for most SDGs. Moreover, citing Dangelico (2017), it seems that most businesses move on the side of SDGs only to find possible benefits in terms of greater market share and profit, whereas pressure from employees and consumer associations was far less important. As well, from a methodological perspective, Cordova and Celone (2019) say studies classify companies in three ways: 1. *defensive/ compliance* (limited integration), where cost constraints are perceived as high; 2. *accommodative* (integration), where there is cautious modification of internal processes; and 3. *proactive* (full integration), where companies integrate sustainability as part of their strategy to contribute to sustainable development of the economy and society (see D'Antonio and Sim, 2017).

Assessing the impact of SDG initiatives requires the development of monitoring and evaluation mechanisms. Achieving the SDGs' targets demands moving from isolated successes to transformative change on a larger scale (Henfrey *et al.*, 2023).

We turn next to SMEs, noting the observation that small businesses occupy a pivotal position as they serve as engines for local development, innovation, and responsible business practices (Costa Melo *et al.*, 2023).

2.2.4 Decarbonisation

Decarbonisation, which entails the reduction of carbon emissions and the transition towards low-carbon energy sources, constitutes a pivotal and indispensable element within the framework of the Sustainable Development Goals (SDGs). Goal 13, specifically designated as "Climate Action," places a significant emphasis on decarbonisation (Upham, Sovacool and Ghosh, 2022). However, this imperative confronts substantial challenges that encompass political resistance, economic implications, and technological impediments, as substantiated in relevant academic literature (Lagioia, Spinelli and Amicarelli, 2023). The urgency of decarbonisation is further underscored by the mounting empirical evidence that shows the adverse

consequences of greenhouse gas emissions on the Earth's ecosystems and vulnerable human populations (Devine-Wright, 2022).

Nonetheless, the trajectory toward realising decarbonisation is fraught with formidable hurdles. These challenges encompass the need to navigate political resistance, reconfigure economic systems that are deeply entrenched in fossil fuel dependency, and surmount the technological barriers inherent to the transition to a low-carbon future, as corroborated by authoritative citations (Heydari, Govindan and Basiri, 2021). However, the process of transitioning towards a low-carbon future needs substantial structural adjustments (Streimikiene, Kyriakopoulos and Stankuniene, 2022). Assessing the impact of decarbonisation efforts is a complex and nuanced venture, as variations across sectors and regions add an element of ambiguity to the assessment process (Reigstad *et al.*, 2022). This ambiguity is the result of the absence of standardised metrics for evaluation, which creates difficulties in comparing the effectiveness of policies and strategies (Zhu *et al.*, 2019; Upham, Sovacool and Ghosh, 2022; Shahabuddin, Brooks and Rhamdhani, 2023).

2.2.5 Circularity and Decoupling

There has been a growing interest in the concept of circularity and decoupling because of their importance in addressing environmental and economic challenges. Circularity involves reusing materials and resources in a continuous cycle to reduce waste, while decoupling aims to separate economic growth from the environmental damage that typically comes with it (Conduit, Karpen and Willmott, 2023). By adopting circularity, it is possible to decouple resource use from economic growth and its associated environmental impacts (Petit-Boix and Leipold, 2018). Integrating decoupling strategies within a circular economy can reinforce sustainability objectives (Graafland and Smid, 2019). Llorente-González and Vence (2019) argues that the adoption of circular practices can facilitate absolute decoupling by minimising material inputs and environmental impacts. When decoupling and circularity principles are integrated strategically, they complement each other and make an ecosystem that is more whole and long-lasting and can provide a solution to resource efficiency, environmental stewardship and economic growth (Ghisellini, Cialani and Ulgiati, 2016).

However, both concepts are difficult to implement. For instance, decoupling is often seen as risky, as it may not be enough to balance economic and environmental goals. For example, one source (Vadén *et al.*, 2020) remarks, “*Decoupling* as a main or single strategy to combine economic and environmental aims should be judged as taking a very large risk with our common future.” Continuing, as Vadén *et al.* (2020) note, the common example is CO2 emissions and economic growth, but none of the many studies cited include the effects of trade and outsourcing on national emissions and GDP accounts.

There is a similar disconnect between academic discussions of circularity that emphasise environmental benefits and business practices where economic gain is prioritised (Petit-Boix and Leipold, 2018). Research suggests it is preferable to pursue both concurrently, rather than to favour one over the other (Lieder and Rashid, 2016). Yet, the evidence is that achieving circularity can lead to competing environmental priorities, and the costs associated with circular systems can create additional problems (Stål and Corvellec, 2018; Voulvoulis *et al.*, 2022). As a result, some argue that improved material efficiency and reduced inputs may be more practical than a focus only on circularity (D’Amato *et al.*, 2017; Dourado, Rallings and Viers, 2023).

Studies also show that reducing resource use can have unintended negative effects, such as increasing consumption elsewhere, known as the *rebound* effect (Llorente-González, and Vence, 2019). Designing products and systems in a way that supports circularity is essential to minimise waste and improve efficiency (Franconi, Ceschin and Peck, 2022). This includes managing both biological cycles, like food and textiles, and technical cycles, such as energy and synthetic materials. Both cycles aim to recover as much value as possible for future use. Biological cycles, involve processes like composting and soil regeneration, while technical cycles focus on reusing, repairing, and recycling materials. Others suggest these measures are not enough, and the literature concludes that this field of study is in its infancy. For the technical cycle, several R-lists have been offered: the **3Rs** (commonly reduce, reuse, recycle), **5-Rs** (refuse, reduce, reuse, repurpose and recycle) and a longer **9Rs** (refuse, rethink, reduce, reuse, repair, refurbish, remanufacture, repurpose, recycle and recover). Reorganising the suggestions, Franconi, Ceschin and Peck (2022) offer this list: maintenance/longevity, reuse, refurbish, remanufacture, and recycle.

There are diverse interpretations regarding the relationship between the environment and economic prosperity, which generate different narratives and influence sustainability perspectives. These perspectives can be categorized as weak (or relative) and strong (or absolute) (Ghisellini, Cialani and Ulgiati, 2016). In a weak or relative decoupling scenario, economic growth may outpace resource use, meaning that while resource use still increases, it does so at a slower rate than economic growth. This distinction affects the type of decoupling process concerning resource use, whether it is relative (growth continues with reduced environmental impact) or absolute (growth occurs with a complete halt or reduction in resource use).

Research suggests that closing material loops, which preserves resources, is a keyway that circular economies contribute to environmental sustainability (e.g., Awan, Sroufe and Shahbaz, 2021). However, focusing solely on this approach may not significantly reduce the extraction of non-renewable resources, especially in economies that continue to grow. Studies on global material flow, such as those by (see Mayer et al., 2019; Corvellec, Stowell and Johansson, 2022) illustrate how circularity can be implemented, but also highlight its limitations. Promoting the closure of material loops supports relative decoupling, which helps balance resource use and economic growth (Lonca *et al.*, 2018; Awan, Sroufe and Shahbaz, 2021). Both circularity and decoupling have strengths in promoting sustainability in a circular economy, but application depends on the goals and interests of different stakeholders.

2.3 CSR Directive (EU 2023)

The global business landscape has witnessed a significant paradigm shift, with increasing recognition of the role played by corporations in addressing societal and environmental concerns. As a response to these evolving dynamics, Corporate Social Responsibility Directives (CSRD) have emerged as crucial instruments guiding businesses towards more sustainable and socially responsible practices (Darendeli *et al.*, 2022). The directives aim to align corporate activities with societal and environmental goals, acknowledging the role of businesses in contributing to broader societal well-being. By mandating CSR reporting, the EU seeks to enhance transparency, accountability, and the overall positive impact of businesses on society (Cuomo *et al.*, 2024). The directive encourages companies to integrate social and environmental concerns into their operations, promoting a shift towards responsible

business conduct. It outlines clear guidelines for reporting on issues such as environmental impact, social inclusivity, human rights, and ethical business practices. This holistic approach reflects the EU's commitment to addressing global challenges, including climate change and social inequality (Oberthür and Dupont, 2021).

Corporations use a range of approaches, frameworks, and tools to evaluate sustainability initiatives. Some popular frameworks are the Global Reporting Initiative (GRI) and the Sustainability Accounting Standards Board (SASB). These reporting frameworks make it easier for businesses to transparently disclose their environmental, social and governance (ESG) performance (SASB, 2021; GRI, 2022). Besides this, many companies have adopted Environmental Management Systems (EMS) aligned with ISO 14001 standards, which also provide a systematic approach to addressing environmental initiatives (ISO, 2024).

Another important dimension of sustainability is the evaluation and improvement of the supply chain. Companies use tools like the life cycle assessment and environmental product declarations. These tools help in the identification and mitigation of sustainability risks across supply chains. Tools like the Carbon Disclosure Project (CDP) to effectively manage their carbon footprint (CDP, 2024a). or the utilisation of frameworks like the UN Global Compact and the Social Value International (SVI) principles for evaluating and reporting on social responsibilities are also common among corporations (SVI, 2023; UNGC, 2023b).

2.3.1 ESG

Environmental, Social, and Governance (ESG) embody an integrated approach to sustainability and responsible business practice (Riva, Magrizos and Rubel, 2021). The environmental dimension (E) emphasises the imperative for businesses to minimise their ecological footprint through strategies such as carbon emissions reduction, resource efficiency, and biodiversity conservation (Eccles and Serafeim, 2013; Gholami, Murray and Sands, 2022). The social dimension (S) underscores the importance of fair labour practices, diversity and inclusion, and active community engagement to foster positive relationships with employees, customers, and communities (Barnett and Salomon, 2006). Lastly, the governance dimension (G) underscores the significance of strong governance structures, transparency, and ethical

leadership, all of which contribute to a company's accountability and integrity (Hermalin and Weisbach, 2017). Collectively, these ESG principles provide a comprehensive framework for businesses to navigate sustainability challenges while simultaneously enhancing their long-term competitiveness and societal impact, aligning profit objectives with broader environmental and social responsibilities (Amel-Zadeh and Serafeim, 2018; Janssen, Fayolle and Wuillaume, 2018).

2.3.2 Implementing ESG

Implementing ESG practices has become integral to business strategies, reflecting a commitment to responsible and sustainable corporate behaviour. Organisations use ESG frameworks to not only mitigate risks associated with environmental and social issues but also to capitalise on opportunities for long-term value creation and enhanced stakeholder relationships (Redondo Alamillos and de Mariz, 2022; Wang, Chu and Hao, 2024). The environmental dimension involves measuring and reporting on carbon footprints, resource efficiency, and waste management. The social dimension involves fostering diversity and inclusion, ensuring fair labour practices, and engaging with communities (GRI, 2022). Lastly, the governance dimension uses principles that emphasise ethical decision-making and transparent reporting. Implementing ESG practices is not without its challenges. Much like CSR, ESG-focused practices require organisations to navigate complexities such as balancing short-term financial goals with long-term sustainability, ensuring accurate reporting and addressing the diverse expectations of stakeholders (Amel-Zadeh and Serafeim, 2018; Ozkan, Romagnoli and Rossi, 2023). What is inarguable, is that the integration of ESG practices signifies a commitment to sustainable development and requires resilience and ethical corporate practices that ultimately contribute to the creation of sustainability.

2.3.3 Sustainability Regulations

To make Europe the world's first climate-neutral continent, the EU proposed a package of policy initiatives in July 2021 (European Commission, 2021a). The European Green Deal was first communicated in 2019 along with the proposal to review Directive 2014/95/EU - the Non-Financial Reporting Directive (NFRD). The NFRD was considered key for ensuring sustainable investments (European Parliament, 2021). This is consistent with the United Nations' explicit call for firms' transparency on their

sustainability performance via reporting (United Nations, 2015). Hence, in April 2021, the European Commission published a proposal to amend the NFRD to ensure more transparency on corporate sustainability. In June 2022, the European Council and Parliament reached a provisional political agreement on the Corporate Sustainability Reporting Directive (CSRD), which was adopted on 10th November 2022 by the European Parliament (European Council, 2022c).

Companies falling within the scope of the CSRD are mandated to incorporate a dedicated section on sustainability matters encompassing environmental, social, human rights, and governance factors, in their annual reports. This new section must include a comprehensive array of disclosures adhering to sustainability reporting standards currently being finalised by the EU.

Table 4. NFRD versus CSRD (Source: Seirbhis Leabharlainne, 2023)

	NFRD (Non-Financial Reporting Directive)	CSRD (Corporate Sustainability Reporting Directive)
Scope	Approximately 11,500 large public interest companies (listed companies, banks, and insurance companies)	Approximately 49,000 companies, including listed SMEs and some non-European companies
Content	General disclosures concerning ESG issues	Core comprehensive disclosures concerning ESG
Format	No mandatory standardised format	Mandatory standardised format
Audit	No mandatory external audit	Mandatory external audit

According to a scoping review conducted by Dinh, Husmann and Melloni (2023), there is little evidence available on the role of financial institutions, including banks and insurers, in the raising and allocation of capital, especially in bank-based European economies (European Commission, 2024). Furthermore, there is limited research on SMEs, which form the backbone of the European economy, and whose exclusion from the CSRD was heavily debated (EFAMA, 2022) Institutional investors such as BlackRock and the International Organisation of Securities Commissions increasingly demand standardised sustainability information (IOSCO, 2022).

However, managers still have high discretion in the frameworks they follow, the quality of information they report, and the assurance they obtain. This results in a

scattered sustainability disclosure landscape globally, even when disclosures are mandated. Companies regularly rely on global guidelines such as the Global Reporting Initiative (GRI). In 2020, steps were taken towards unifying sustainability reporting, with third parties such as rating agencies providing standardised sustainability information (e.g., Bloomberg, 2021).

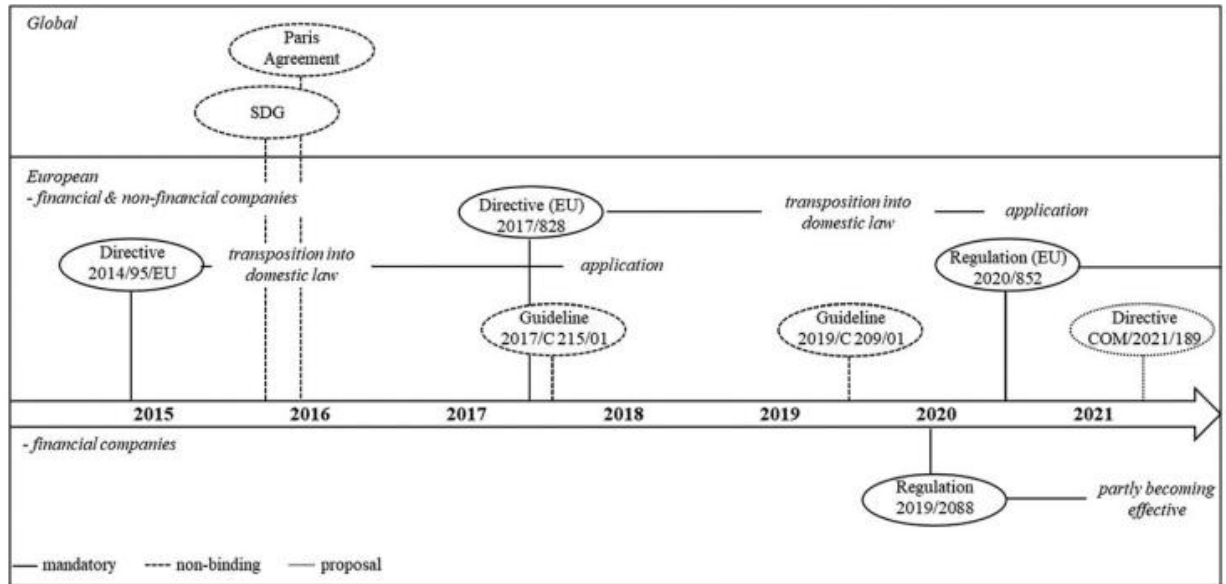


Figure 8. Key Global and European Initiatives (Dinh, Husmann & Melloni 2023)

- **Mandatory regulations:** Since 2018, Directive 2014/95/EU (the NFRD) requires large EU public-interest companies with more than 500 employees to disclose environmental and social information. When effective, the Directive COM/2021/189 (the CSRD) amending the former NFRD will greatly increase the scope of companies subject to the mandate and provide more guidance on the information to disclose. Furthermore, it will require a third-party audit or certification of reported information and the publication of XHTML financial statements and management reports.
- **Regulatory standardisation:** Since 2021, Regulation 2019/2088 (the Sustainable Finance Disclosure Regulation, SFDR) requires financial market participants and financial advisors in the EU to apply a binding transparency framework based on entity- and product-level information requirements. Furthermore, Regulation 2020/852 (the Taxonomy Regulation) establishes a

green taxonomy, that is, a classification scheme to identify environmentally sustainable investments.

2.3.4 Regulatory Uncertainty for SMEs

Small and medium-sized enterprises (SMEs), constituting over 90% of businesses and contributing to more than 50% of employment, play a crucial role in the European economy (Muller et al., 2021; World Bank, 2023). The majority of these SMEs are privately owned and predominantly rely on bank financing, with loans as the primary source (45%), while market-based instruments like debt (2%) and equity securities (10%) are less common (European Central Bank, 2020). There are also significant variations across Europe in the number of SMEs, their value-added, and their employment rates (Muller et al., 2021; Schuh et al., 2017). Notably, however, SMEs in Europe face less regulatory pressure on reporting sustainability as the non-financial reporting directive (NFRD) only applies to large public-interest companies such as listed companies, banks, insurance companies and entities designated as of public interest provided, they have over 500 employees (ISB, 2017).

As per the initial CSRD proposal by the European Commission in April 2021, SMEs were initially required to comply with the regulations with a three-year delay. However, in the revised version from February 2022, there was a notable divide among delegations, with some advocating for the exclusion of all SMEs from the scope, while others sought simplified standards (European Commission, 2021c; European Council, 2022a; European Fund and Asset Management Association, 2022). This highlights the contentious debates surrounding whether SMEs should be encompassed by the CSRD and mandated to provide more transparent sustainability disclosures (European Council, 2022b). The June 2022 version indicates a provisional agreement that CSRD rules should apply to SMEs, with an opt-out option available until 2028 (European Council, 2022c). The CSRD will apply on a phased basis depicted in Figure 9:

- for financial years starting on or after 1 January 2024, for large public interest companies already subject to the NFRD, with reports due in 2025;
- for financial years starting on or after 1 January 2025, for other large undertakings as defined under the CSRD, with reports due in 2026;

- for financial years starting on or after **1 January 2026, for listed SMEs, with reports due in 2027**. SMEs can effectively opt-out for a two-year transitional period until 2028 if they explain in their management report why sustainability reporting was not provided; and
- for financial years starting on or after 1 January 2028, for in-scope non-EU undertakings, with reports due in 2029.

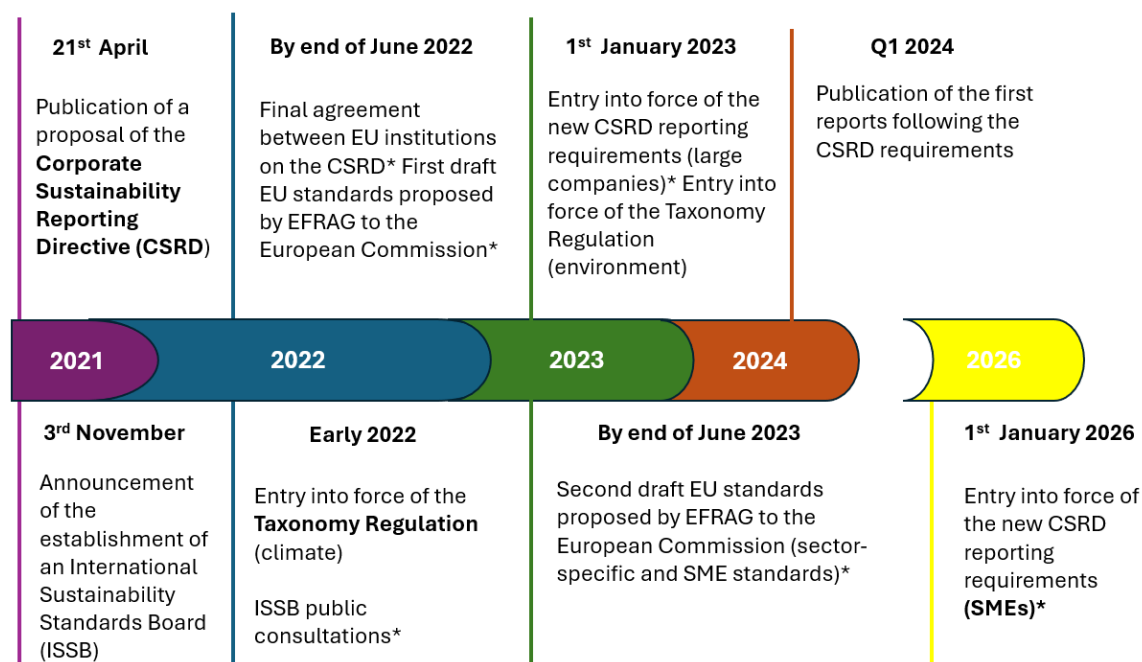


Figure 9. CSRD Timeline (European Commission, 2024)

In Ireland, SMEs are similarly integral to the economic landscape, comprising a significant portion of businesses and contributing substantially to employment. These SMEs, while diverse in sectors and sizes, face distinct challenges in the realm of sustainability reporting (Arafat, Dunne and Ahmed, 2020). As the global focus on environmental, social, and governance (ESG) factors intensifies, there is an increasing recognition of the need for SMEs in Ireland to prioritise sustainability reporting. Such reporting not only enhances transparency and accountability but also positions SMEs to navigate evolving market expectations and regulatory landscapes.

Embracing sustainability practices is not just a matter of compliance. Rather, literature suggests it can serve as a strategic move for SMEs, fostering resilience, attracting socially conscious investors, and aligning with a growing consumer demand for environmentally and socially responsible business practices (Andersson, Dickin

and Rosemarin, 2016; Martinez-Cillero, Lawless and O'Toole, 2020). As Ireland continues to emphasise sustainable development, encouraging and supporting SMEs in integrating sustainability reporting into their operations becomes crucial for long-term success and for positive contributions to a more sustainable future (Ghadimi *et al.*, 2021).

2.3.5 Carbon Emission and Scope 1, 2 and 3

Carbon emissions are responsible for 81% of greenhouse gas (GHG) emissions. As Porter *et al.* (2007) remark, climate change is no longer a corporate social responsibility issue. Rather, it and sustainability are now a business imperative, and one way for businesses to reduce their carbon footprint is to measure their carbon emissions. Scopes 1,2 and 3 are the basis of mandatory GHG reporting across the respective value chains (European Commission, 2024) . These emissions are measured by category and businesses are now required to classify their carbon footprint (National Grid, 2021).

Scope 1: Direct Emissions that are controlled by a company. Example: Burning of fuel.

Scope 2: Indirect Emissions that are a consequence of a business' action but occur from a source that is not owned or controlled by the business. Example: Emissions generated from the purchase of electricity.

Scope 3: Indirect Emissions not included in Scope 1 and 2 but are generated by a business's value chain. Example: When a company buys, uses and disposes of products from a supplier (Wittevrongel, 2022).

SMEs are exempted from the mandatory legal reporting requirements due to their size and lack of resources (Mazhar *et al.*, 2024). Nevertheless, a few have started implementing carbon management and reporting on their activities (Font *et al.*, 2012). Policy incentives such as grants and loans from the Irish government have supported these SMEs in their transition (Kazemian *et al.*, 2022). Although there has been a shift in the mindset of SME owners, there still is a need to push these SMEs to comply with the help of the regulatory framework.

2.4 CSR

A precursor issue to ESG, corporate social responsibility or CSR represents a challenge for both national and organisational management. Friedman (1970) was one of the earliest to argue that profit was the (sole) basis of business social responsibility, suggesting the concept was “almost impossible to achieve” by placing the onus on corporations (González-Rodríguez, Díaz-Fernández and Simonetti, 2015). Later, recognising the fundamental nature of CSR, Friedman recanted, acknowledging that CSR needed to succeed “*if our society and the economy are to continue and to succeed*” (Mintzberg, 1983). The core implementation issues identified related to trust and to the fact that CSR is often used as a giant public relations exercise, while businesspeople were also, in Mintzberg’s view, ill-equipped to deal with social issues, with the absence of structures and a cynical attitude (greed) defining competition that precludes CSR. This presumption of responsibility returns us to Friedman’s earlier question that asks, to whom are businesspeople (socially) responsible?

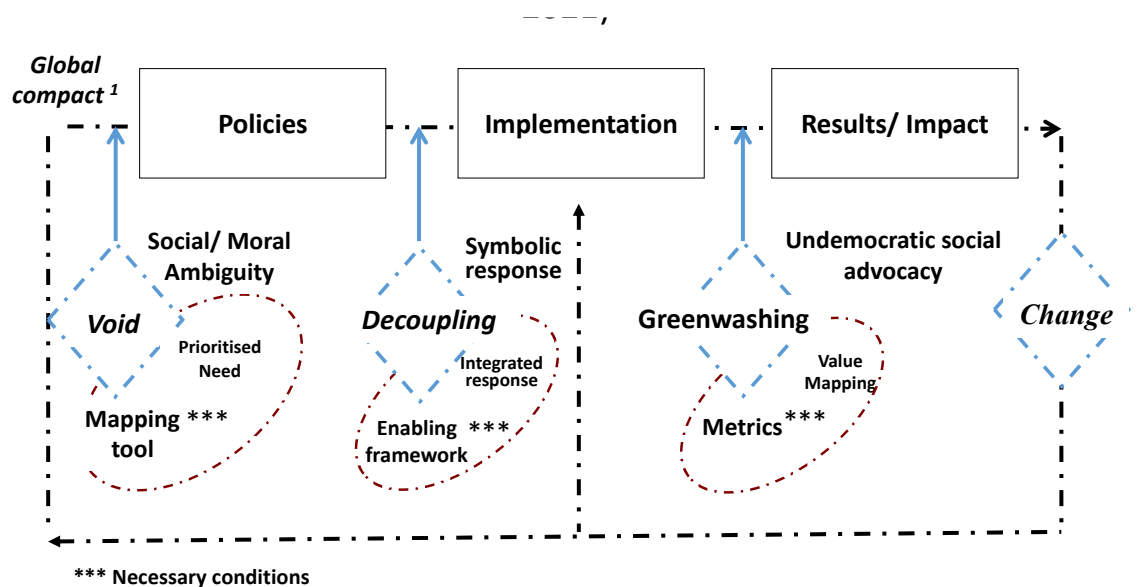
A working definition for CSR could be “actions that appear to further some social good, beyond the interests of the firm and that which is required by law” (McWilliams and Siegel, 2001). Some implicit components of this definition are that CSR refers to the way companies “integrate social and environmental concerns in business operations and their interactions with their stakeholders on a voluntary basis” (Tencati, Perrini and Pogutz, 2004; Spence, 2007; Aras and Crowther, 2008), while Székely and Knirsch (2005) argue that CSR is about creating a society that lives with a significant balance between economic, environmental and social goals.

These goals and effective CSR practices can enhance a company’s image, improve financial revenues, increase firms’ value and enhance sustainable development (Kolk, 2016; Marín, Cuestas and Román, 2016; Mishra and Modi, 2016; Omair Alotaibi and Hussainey, 2016). Conversely, including social concerns as part of a company’s strategy requires tremendous effort and a change in decision-makers thinking (Calabrese et al., 2013). It is clear managers face the same complexity that Mintzberg noted earlier in determining how to address the concerns of stakeholders (Gupta, Pingali and Pinstруп-Andersen, 2017). A primary challenge is identifying the key factors to ensure the consistency of the quality of local CSR activities. Another important concern that has gained recent momentum is the growth in demand for

ratings and benchmarking tools to evaluate CSR (Gallardo-Vázquez and Sanchez-Hernandez, 2014; Carroll, 2016). Evaluating CSR and improving social performance are now indispensable imperatives for organisations (Márquez and Fombrun, 2005; Consolandi et al., 2009).

2.4.1: Implementing effective CSR

While the internal and external policy drivers for CSR are clear, implementing effective CSR is problematic (Graafland and Smid, 2019). The focus on impact or results, labelled as corporate social performance (CSP) by Graafland and Smid, 2019, highlights the need to understand relationships in CSR beyond narrow strategic interests and to embrace performance that is more substantive rather than simply symbolic. Figure 10 illustrates a 3-stage process – policy, implementation and impact – with two mediating tensions also identified: the potential *decoupling* between policy and practice, and the potential means-end decoupling called *green-washing* that suggests a gap between communications and actual performance when reporting (Bromley and Powell, 2012; Graafland and Smid, 2019).



1. UN Global Compact: enhance the standard of living and rights of many people who are 'shut out' of the political process (Blowfield & Murray, 2014).

Figure 10. CSR Policy, Implementation & Impact Framework (Source: Bantan and Thomas 2021)

Given the multiple, competing stakeholder interests, assuming no policy void, two tensions are noted. First, the potential decoupling between policy and implementation reflects a tension between external (legitimacy) pressures and internal efficiencies. Conversely, a second tension, greenwashing, points to the potential discrepancy between positive communication and poor performance, the result of both external and internal drivers. Both tensions explain the utility of reporting CSR, both as a mechanism for continuous improvement and for greater accountability (Coelho et al., 2023).

2.4.2 Reporting

Stakeholders are increasingly seeking transparency in Corporate Social Reporting (CSR) practices, and businesses are recognised and rewarded when their social actions are in line with stakeholder interests (Barnett and Woywode, 2004; Marín, Cuestas and Román, 2016). As a result, CSR has become an important component of corporate strategy, forcing companies to avoid not only unethical behaviours but also actions that might appear inconsistent with stakeholder expectations and needs (Marín, Cuestas and Román, 2016). However, studies suggest that CSR reports often lack the *relevance* and *credibility* stakeholders need, complicating the evaluation of corporate performance (Hąbek and Wolniak, 2016). This issue is even more prominent for SMEs, where limited resources hinder the ability to produce high-quality transparent reports (McAdam 2000).

Nonetheless, reporting (sustainability practices) in SMEs is crucial in promoting transparency and accountability regarding the business' environmental, social and financial impacts. It demonstrates a company's commitment to sustainability and helps meet stakeholder demands for ethical business practices and regulatory compliance. Table 5 outlines several global reporting frameworks:

- the Global Reporting Initiative (GRI), which addresses key ESG principles, is the most widely used (GRI, 2021);
- the United Nations Global Compact (UNGC) encourages CEOs to commit to sustainability;
- while Integrated Reporting (IR) links value creation with sustainability information in financial disclosures (IIRC, 2024); and

- Finally, the Carbon Disclosure Project (CDP) emphasises environmental transparency, particularly greenhouse gas (GHG) emissions (CDP, 2014), while the Sustainability Accounting Standard Board (SASB) provides sector-specific guidelines on reporting environmental information (SASB, 2021).

Table 5. Reporting Standards (Source: Rodríguez-Gutiérrez et al. 2021)

Standard	Organisation	Brief Description of the Standard
Global Reporting Initiative (GRI)	Global Reporting Initiative	The Global Reporting Initiative (GRI) is a framework for comprehensive corporate social responsibility reporting on environmental, social and governance topics (GRI, 2021)
United Nations Global Compact (UNGC)	United Nations	Initiative based on CEOs' commitments to implement universal sustainability principles
		and take steps to support UN goals (UNGC, 2023a)
Integrated Reporting (IR)	International Integrated Reporting Council	Integrated reporting is a process founded on integrated thinking that results in a periodic integrated report by an organisation about value creation over time and related communications regarding aspects of value creation (IIRC, 2024)
Carbon Disclosure Project (CDP)	Carbon Disclosure Project	The primary focus of CDP is the reporting of environmental information, particularly greenhouse gas (GHG) emissions, with CDP referring to itself as a 'global system for companies and cities to measure, disclose, manage and share vital environmental information (CDP, 2024b)
Sustainability Accounting Standards Board (SASB)	Sustainability Accounting Standards Board	SASB has developed sector-specific KPIs for sustainability, SASB provides a series of standards to reporting companies from all sectors with regard to environmental information and natural capital reporting as further guidance for certain environmental metrics (SASB, 2021; CDP, 2024b)

2.5 SMEs and Sustainability

SMEs are the predominant form of business organisation in the world and are significant contributors to economic development (Klewitz and Hansen, 2014c), playing a significant role in generating employment, driving innovation and creating wealth (Hansen and Klewitz, 2012). Being the backbone of many economies, SMEs have gained widespread attention among policymakers, scholars, and industry experts (Mikayeva and Mikayeva, 2018) and the increased focus on addressing environmental, social, and economic challenges has propelled the study of sustainability practices within SMEs to the forefront of academic inquiry (Dey, Chrisovaladis Malesios, *et al.*, 2022). This emphasis on SMEs is critical due to the cumulative impact these businesses have on resource consumption, waste generation, and community well-being (Bos-Brouwers, 2010), while successful uptake of sustainability is essential to enhance the long-term viability, competitiveness and resilience of the economy in an evolving global business environment (Muhammad *et al.*, 2010; Belyaeva *et al.*, 2020; Georgiou *et al.*, 2023). Table 6 compares small and large businesses to illustrate the relative characteristics of the two business categories.

Table 6. Comparison of SMEs and Large businesses (Source: Bos-Brouwers (2010, p.419).

SMEs	Large Businesses
Dominant role of owner/manager	Management control between directors and stakeholders
Limited resources (assets, time, knowledge, skill)	Economy of scale, resource abundance
Flexible organisation capacities	Bureaucratic rigidity
Focus on short-term	Focus on mid to long-term
Strong local/regional focus and customer needs	Strong (inter)national focus and loose ties with customers
Low level of formalisation	High level of formalisation

The significance of the SME sector in bolstering the economic competitiveness of nations has been widely acknowledged in academic literature (Parker, Redmond and Simpson, 2009; Du and Banwo, 2015; Granados, Rosli and Gotsi, 2022). It is estimated that, on average, this sector contributes to approximately 70% of a country's gross domestic product (GDP), albeit with variations across different nations (Prasanna *et al.*, 2019). In the European Union, SMEs constitute a substantial

proportion of the business landscape, accounting for 99.8% of all enterprises, employing 66% of the total workforce, and generating 65% of businesses with fewer than 250 employees or those with a turnover of less than €50 million. Globally, SMEs represent a dominant force, constituting 90% of all businesses and employing over 50% of the workforce (McKenzie and Woodruff, 2014; Carayannis *et al.*, 2020).

According to the Organisation for Economic Co-operation and Development (OCED) SMEs are responsible for 70% of total employment in Ireland (OECD, 2019). The contribution of SMEs to GDP is substantial in numerous countries, surpassing 50% in many instances (International Labour Organisation, 2020). As of the beginning of 2018, SMEs accounted for 99.9% of all private sector businesses, 59% of private sector employment, and 51.0% of private sector turnover in Europe (Belyaeva, 2018; Dinh, Husmann and Melloni, 2023). The European Commission has underscored the pivotal role of Europe's 25 million SMEs, constituting the backbone of the EU economy. These SMEs employ approximately 100 million people, generate more than half of Europe's GDP, and contribute significantly to value creation across various sectors (European Commission, 2023).

Furthermore, SMEs play a crucial role in addressing contemporary challenges such as climate change, resource efficiency, and social cohesion, actively propagating innovation throughout Europe (European Commission, 2023). As Europe transitions toward a sustainable and digital economy, SMEs are central to driving these twin transformations (European Commission, 2023). Therefore, understanding the dynamics, challenges, and opportunities within the SME sector is of paramount importance for both policy formulation and scholarly inquiry to harness the full potential of this sector in the context of sustainable economic development.

Table 7. Description of SMEs according to the European Commission 2023

Category	Number of Employees	Turnover
Micro	1 to 9	≤€2 million
Small	10 to 49	≤€10 million
Medium	50 to 249	≤€50 million or balance sheet of total ≤€43 million
Large	Over 250	≤€50 million and above

2.5.1 SMEs and Entrepreneurial Opportunities

Noting the importance of innovation, Table 8 presents three descriptive types of entrepreneurial opportunity (EO): Allocative, Discovery, and Creative (Sarasvathy *et al.*, 2010). The attributes described by the respective EO categories illustrate aspects that can shape sustainability uptake in SMEs (Dean and McMullen, 2007; Johnson and Schaltegger, 2020).

- The *allocative* view posits that opportunities are recognised through deductive processes and efficient resource allocation towards pre-defined ends, relying on complete information and homogeneous expectations at both micro and macro levels. This view emphasises systematic planning and risk management to achieve sustainability goals.
- In contrast, the Discovery view focuses on identifying and correcting system errors through inductive processes, with partial information distributed imperfectly among agents. This approach advocates for experimentation and resilience in outliving failures.
- Finally, the Creative view, emphasises opportunity creation through abductive processes. A Creative entrepreneur is able to operate under conditions of significant uncertainty and partial information, and fosters innovation and stakeholder collaboration to establish new sustainability practices and business models.

Table 8. Views of Entrepreneurial Opportunity (Adapted from Sarasvathy *et al.*, 2010)

View	Allocative View	Discovery View	Creative View
What is an opportunity?	Possibility of putting resources to good use to achieve given ends	Possibility of improving the system and creating new ways of achieving ends	Possibility of creating new means as well as new ends
Focus	Focus on systems	Focus on processes	Focus on decisions
Method	Opportunities "recognised" through deductive processes	Opportunities "discovered" through inductive processes	Opportunities "created" through abductive processes

Domain of application	When both supply and demand are known	When only one or the other (supply or demand) is known	When supply and demand are unknown
Distribution of opportunity vectors	Opportunity vectors are equally likely	Existent, but unknown probability of opportunity vectors	Probabilities for opportunity are non-existent
Assumptions about information	Complete information is available at both aggregate and individual levels	Complete information at the aggregate level, but distributed imperfectly among individual agents	Only partial information even at the aggregate level, and ignorance are key to opportunity
Management of uncertainty	Uncertainty managed through diversification	Uncertainty managed through experimentation	Uncertainty managed through effectuation
Definition of success	Success is a statistical artefact	Success is outliving failures	Success is negotiated by consensus among stakeholders
Unit of competition	Resources compete	Strategies compete	Values compete
Outcomes	Strategies for risk management	Strategies for failure management	Strategies for conflict management

In a literature review of the relationship between innovation and SDGs in a business context, Cordova and Celone (2019) noted a strong interplay between the two in all phases, from discovery or opportunity recognition, to evaluation, and implementation that includes iteration. While entrepreneurial training is useful in educating managers on sustainability, product/service entrepreneurship, including sustainability-intensive service innovation, and adaptation of business models to achieve sustainable development is highlighted by Cordova and Celone (2019). Entrepreneurship results from the interaction between individuals' cognition (thinking) and institutional/environmental factors that are widely recognised as a driver of economic and social development (O'Donnell *et al.*, 2023).

Consequently, noting entrepreneurial 'uptake' came from a combination of market need and the ability of entrepreneurs to meet that need, 'recognising' entrepreneurial opportunity (EO) depends upon an entrepreneur's traits, knowledge, experience and capabilities, shaped by the surrounding environment that includes rules, social networks, and economic conditions (Eckhardt and Shane, 2003).

Reflecting on this relationship, entrepreneurship can be categorised (Huang *et al.*, 2023) broadly into:

- *necessity-driven*, usually due to work and financial challenges, or
- *opportunity-driven* which comes from a desire to profit from the market gaps (Davidsson, 2015).

These two broad categorisations are discussed next.

2.5.1.1 Opportunity and Necessity Entrepreneurship

The Global Entrepreneurship Monitor (GEM), an annual assessment of national entrepreneurial activity, categorises businesses broadly into necessity—or survival-driven and opportunity-driven types (GEM, 2024). The dominant logic for entrepreneurial activity is motivational push (by outside or extrinsic reasons) vs pull (by inside or intrinsic reasons) (Schjoedt and Shaver, 2007; Giacomini *et al.*, 2023). Opportunity-driven entrepreneurs engage in entrepreneurship because they see the potential for increased growth and income (Schjoedt and Shaver, 2007). On the other hand, necessity-driven entrepreneurs start their businesses out of a lack of income sources and their major motivation is to survive and make profits (Shepherd, 2011).

There is a fundamental distinction between opportunity- and necessity-driven entrepreneurship. These two approaches contribute differently to economic development. Necessity entrepreneurship can alleviate unemployment and provide immediate income. However, businesses that are necessity-driven tend to be less profitable and less innovative compared to opportunity-driven entrepreneurship, which aims for market expansion and long-term sustainability (Cervelló-Royo *et al.*, 2020). The push-pull theory explains how external factors, such as economic instability and social conditions, influence individuals' decisions to engage in necessity entrepreneurship (Schjoedt and Shaver, 2007). Some scholars argue that necessity and opportunity entrepreneurship are not mutually exclusive. Rather, they can coexist, with individuals transitioning between the two based on changing circumstances (Giacomini *et al.*, 2023). However, the difference in these forms is crucial for policies aimed at supporting entrepreneurs in marginalised contexts.

A further distinction between the two forms of entrepreneurship is institutional context (Huang et al., 2023). This warrants distinct strategies at various stages of business development. Countries, and cultures inclined towards innovation, they say, should consider strategies that kindle an entrepreneur's innovation prowess, with a focus on opportunity-driven entrepreneurship. Conversely, countries and cultures driven by efficiency should refine their institutional frameworks to fortify necessity-driven entrepreneurship, possibly within institutional structures. Finally, as Child et al. (2017) in highlighting context and business owner experience warn, while there is a great focus on innovation, there is a need to discriminate between forms of innovation likely to give a competitive advantage given the industry context. For smaller firms, successful strategies are likely to be industry-specific, and home-economy development and business owner's experience are likely to be most influential.

2.5.2 Sustainability in Irish SMEs

The extant literature on sustainability and Small and Medium Enterprises (SMEs) brings forth several prominent research concerns. The first issue pertains to the universal applicability of the sustainability challenge, emphasizing that no business entity, including SMEs, can evade the imperatives of sustainability (Prasanna et al., 2019). Second, it flags the necessity to rectify a misperception among (some) SME owners/managers that their operations bear no substantial environmental impact, thereby highlighting the need for enhanced environmental awareness and accountability in their operations (Cantele & Zardini, 2020). Third, the literature illuminates the potential advantages accessible to SMEs through the adoption of sustainable business practices if they can overcome the barriers to implementing sustainability practices (Journault, Perron and Vallières, 2021). Lastly, it accentuates the pivotal role that SMEs can assume in addressing the sustainability challenge, particularly owing to their embedded presence within local communities, with a specific focus on the context of Ireland.

Turning to SMEs in Ireland. Roper(a) (1997) examined the impact of innovation on the growth of SMEs in Ireland, while Roper(b)(1997) discussed the relationship between strategic initiatives and SME performance. Both studies highlight that strategic choice significantly influences growth and profitability, though

not asset utilisation. Neville and Lucey (2022) who investigated the capital structure of high-tech Irish SMEs, noted a shift from equity to debt financing over time, with older firms relying more on retained earnings. Additionally, incubators and accelerators negatively correlate with profitability. Ghadimi et al. (2021) identify enablers of successful green manufacturing in Irish SMEs, emphasising that strong green supply chain relations are outcomes, not drivers of these practices. They also noted that innovation was crucial for competitiveness in sustainability. These papers, though focused on innovation and strategy, are concerned with accountancy and financial aspects rather than sustainability practices in SMEs. As a result, the papers contribute more to the understanding of financial performance and innovation in SMEs, rather than their sustainable business practices.

2.5.3 Measuring and reporting impact (of Sustainability)

Common metrics for measuring the impact of sustainability are based on the three interdependent dimensions of the triple-bottom line: environment, social and economic (Elkington, 1998; Laedre *et al.*, 2015). While these three categories are widely accepted, a further challenge arises when indicators are categorized by their strategic, tactical, or operational perspectives. Laedre et al., (2013) identified a significant controversy in this approach., For example, in a study of 124 indicators used to assess the impact of a road investment project, Laedre et al. (2015) found that, in retrospect the strategic economic impacts were seen as most important. As highlighted in the project management literature, two key questions emerged: the perspective from which sustainability should be assessed and the timespan over which it should be evaluated. Both questions involved considerable challenges. To use a topical example, electric vehicles (EVs) can be judged as sustainable from an end-user perspective, as they reduce CO₂ emissions (environmental pillar), increase mobility (social pillar) and provide cost-efficient transportation (economic pillar). However, from an international perspective, problems linked to battery production, car availability, electric power production and other factors may far outweigh any local advantages (Laedre et al., 2013).

In sum, a multidimensional framework of sustainability that comprises natural, social, and economic dimensions, is necessarily subject to further elaboration and modification based on contexts (Hart and Milstein, 2003; Lawrence et al., 2006; Borga

et al., 2009; Hubbard, 2009). The sustainable value framework tailored for businesses by Hart and Milstein (2003) helps introduce four broad quadrants that help explore sustainability in four broad interrelated dimensions: external /internal, and future (or strategic) /today (or operational) - see Figure 11.

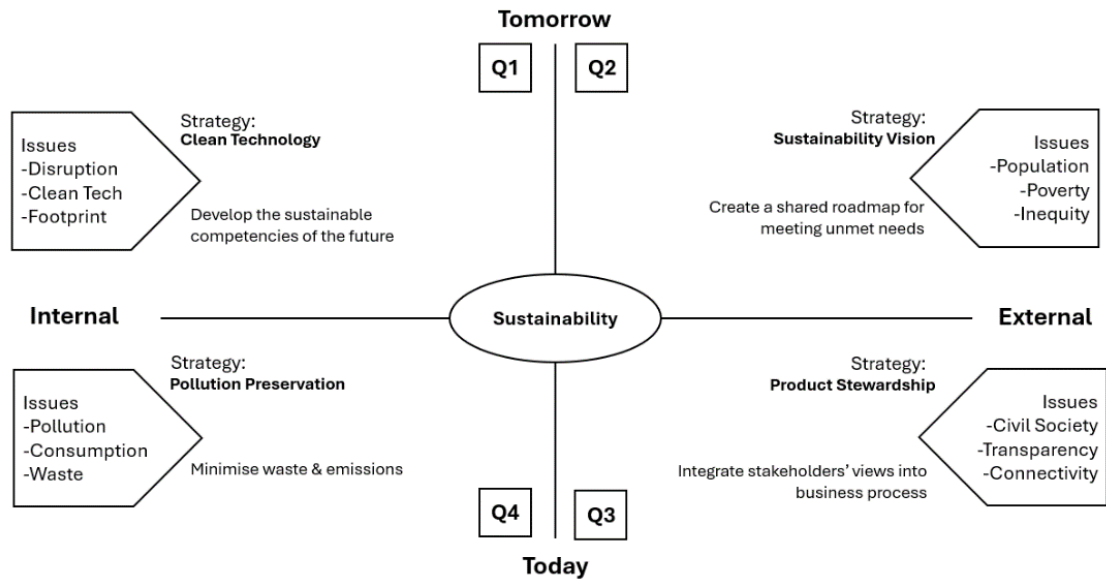


Figure 11. Sustainability Value Framework (Hart & Milstein, 2003)

The internal, immediate concerns (Q4) encompass aspects such as pollution, consumption, and waste, necessitating pollution prevention strategies. In contrast, the internal, long-term concerns (Q1) are illustrated by the adoption of clean technology to curtail environmental disruption, aligning with the imperative to reduce humanity's ecological footprint. External, immediate interests (Q3) centre on civil society and stakeholders' demands for transparency and engagement, prompting the adoption of a product stewardship approach that integrates stakeholder perspectives into business processes. External, long-term interests (Q2) are intertwined with global challenges like population growth, poverty, and inequality, necessitating a sustainability vision within firms. Given the interconnections, as Savitz and Weber (2006) assert, the initiation of a sustainability program should not be treated as an isolated endeavour but should be an integral component of an overarching strategy. The sustainable value framework emerges as a valuable instrument for clarifying a firm's strategic orientation and the forces shaping its sustainability endeavours.

To operationalise sustainability, firms must formulate a comprehensive approach because business operations are contingent not solely upon financial capital, but also on social and natural resources (Wagner and Lutz, 2017). Thus, the business interpretation of sustainability must transcend the pursuit of eco-friendly practices and environmental stewardship, to include economic and social considerations (Werbach, 2011). As an example, the Toyota Motor Company leveraged a sustainability strategy by prioritising the production of high-quality, fuel-efficient small cars and hybrid power systems, leading to substantial profitability (Hart and Milstein, 2003; Werbach, 2009). In contrast, Ford Motor Company which pursued a strategy centred on larger vehicles, experienced significant losses during 2007 and 2008. Werbach (2011) highlighted Toyota's adept incorporation of four sustainability dimensions—economic, social, natural, and cultural, with the company grasping the evolving societal expectations regarding the natural environment to align its management culture with sustainability imperatives.

2.5.4 Implementing Sustainability in SMEs

The most significant distinction for SMEs relative to their larger counterparts is their constrained resources. This limitation implies that the management of a small business differs from that of a larger corporation (Welsh & White, 1981). That said, most challenges confronted by SMEs pertain to financial aspects. The reality is that economies-of-scale prominently favour larger corporations, enabling them to harness purchasing power, minimise production costs, and secure substantial discounts (Nooteboom, 1988; Predescu et al., 2023; Prasanna, et al., 2019). For this reason, in relative terms, restricted access to financial resources is a formidable barrier that limits the viability and capacity of SMEs, and it is a reality evidenced in a staggering twenty-five per cent of SMEs succumbing to insolvency due to delayed payments linked to cash flow.

Restricted availability of financial resources is not however the only issue that negatively impacts the implementation of sustainability in SMEs. Some other issues that impact are summarised below as highlighted by research contributions including Audretsch and Belitski (2017) and Doern, Williams and Vorley (2019).

2.5.4.1 People

Human resource-related issues such as high labour costs exert a profound influence on the viability and general performance of Small and Medium Enterprises (SMEs) – see for example, research by (Fliess & Busquets, 2006; European Commission, 2008-c). Typically, within the SME context, an owner-manager assumes multifaceted responsibilities encompassing various facets of business operations. These individuals most likely lack the requisite proficiencies to effectively discharge sustainability-specific considerations, let alone their general duties as earlier asserted by Nooteboom (1988). Simply, the managerial competence of SME owners is a fundamental prerequisite for success, a view corroborated by studies by Freel (2000) and Heraty (2005). In this regard, the evidence is that SME managers struggle with the challenge of formulating and executing strategic plans, along with adapting to external variables - see Ricketts Gaskill et al. (1993) and Hassid (2002).

In addition to capable management, SMEs also depend on a skilled workforce characterised by continuous learning and adaptability. The absence of relevant and timely training and related development initiatives can adversely impact competitiveness (Hunt 2017). Another surprising feature, despite the general characterisation of SMEs as nimble and adaptable entities, is a tendency towards resistance to change. Instead of embracing change with optimism, the literature strongly suggests many owner-managers in SMEs exhibit a pervasive reluctance towards change and harbour great apprehensions regarding the implications of change. This viewpoint resonates also in the works of Storey (2022), Romero-Martinez et al. (2023), and Wooi and Zailani (2021).

2.5.4.2 Regulations

Regulations significantly contribute to the administrative burdens faced by enterprises, resulting in potential costs that can be up to ten times higher when compared to larger corporations performing similar tasks. SMEs can find it challenging to navigate the same volume of bureaucratic procedures, a predicament that is well documented in early literature (Boswell, 1973; Predescu et al., 2010).

The continued prosperity of small businesses is their capacity to innovate, a theme echoed across various scholarly sources (Nooteboom, 1988; Freel, 2018;

Romero-Martinez et al., 2023). Yet even though the manufacturing sector relative to other sectors is doing well in Ireland, inadequate investments in innovation have presented challenges to the internationalization efforts of small enterprises, a limitation explored in research by Madrid-Guijarro et al. (2021). The principal obstacles are interconnected - insufficient financial resources, managerial expertise, pertinent information, regulatory hurdles, the establishment of strategic partnerships, and the scarcity of skilled labour, with a particular emphasis on marketing skills (Freel, 2000). It is also worth noting that the inherent risks associated with innovation discourage potential investors and funders. Consequently, SMEs engaged in more innovative endeavours often face greater challenges in securing financial support, rendering them less successful in this regard when compared to their non-innovative counterparts, as observed in the works of Freel (2000) and Madrid-Guijarro et al. (2019).

2.5.4.3 Lack of information

The lack of access to information poses a significant challenge to SMEs as it imposes an additional strain on their resources (Eppler and Mengis, 2019; Wooi and Zailani, 2020). Studies suggest that SMEs often struggle to access information due to either an overwhelming abundance or a significant scarcity of available resources (Edmunds and Morris, 2021). Access to relevant information (knowledge) is important, especially when it comes to prioritising data, and it can heavily shape business decisions and strategies. Missing or misinterpreting essential information such as changes in laws or the addition of new laws can negatively affect the business' performance (Edmunds and Morris, 2023).

2.5.4.4 Environmental Responsibilities

Understanding and addressing environmental responsibilities is increasingly vital for SMEs. SMEs need to proactively adapt to regulatory requirements which can help them increase their environmental accountability. This will not only foster compliance with evolving legislation but will also create more opportunities for innovation, cost saving and competitive advantages for SMEs. When SMEs understand their environmental responsibilities, they can help contribute to the broader sustainability goals (Davis, Green and Reed, 2009; Gurău and Dana, 2018). The financial and

resource demands entailed in implementing stringent standards like ISO 14001 or EMAS can curtail the market potential of SMEs. Given that many customers demand rigorous compliance, it is noteworthy that smaller businesses are markedly less likely to attain certification compared to their larger counterparts, a fact corroborated by the European Commission (2008-c).

2.6 Implementing policy change

The preceding discussion has highlighted the interconnection, interlinkage and interdependencies of the many challenges that face SMEs required to take up sustainability practices. In policy terms, implementing changes related to sustainability is well illustrated by CSR. This business literature has pointed to decoupling (between policy and practices), and greenwashing where performance does not match or is over-reported in business communication, as well as the value of measuring (metrics) and reporting performance (Hengst *et al.*, 2019). The following sections illustrate change initiatives that add further insight to the challenges facing the implementation of change

2.6.1 Lessons from Earlier Change Initiatives

In earlier change initiatives related to anti-smoking, wearing of car seatbelts and the war on drugs, the general lessons for successful change involved both top-down and bottom-up approaches. Top-down changes, by the government and associated public and corporate bodies, included such things as sympathetic car seatbelt design, regulatory policy, including active enforcement by police, changed advertising at sports grounds and associated imagery that displayed the negative effects of smoking tobacco and car accidents, as well as health insurance costs and widespread supportive TV and media advertising (Farooq, Ahmed and Saeed, 2021). Bottom-up or community-based changes were driven by information dissemination, education and health and safety campaigns that gradually altered social and behavioural norms and made non-compliance socially unacceptable.

Earlier change initiatives offer valuable lessons for initiatives seeking to advance sustainability practices uptake, noting that the relative capacity of large and small businesses is disproportionate. Consistent with the sustainable value framework

tailored for businesses by Hart and Milstein (2003) (Figure 11), the task is to formulate an integrated strategy involving four broad interrelated quadrants: external /internal, and future (strategic) /today (operational). A summary of lessons, as well as public health challenges with interventions, are categorised as follows:

- Design/ Technical interventions - reinforce behaviour with graduated (first and second level) design actions that include sound and visual messages; SUV driving tends to masculinise female drivers (Wallner, Wanka and Hutter, 2017).
- Governance, including active enforcement – regulatory enforcement, as well as supportive media advertising guidelines, insurance; wearing helmets can increase risk-taking behaviour (Gamble and Walker, 2016),
- Human factors/ Behavioural norms – safety culture, group cohesion (drinks and drugs) considerations; fatigue, stress, drug use (Petridou and Moustaki, 2000); non-linear effects of some risk factors (DIU vs fatigue) – (Carrodano, 2024)

2.6.2 Prioritising Survival

The shadow reality of CSR(D) concerning SMEs is that there is a deliberate policy by the Government in Ireland and the EU Commission to focus on building awareness in SMEs and not press these small businesses on sustainability uptake. The priority, understandable given the size of the overall sector in Ireland and the EU, is survival. The policy implementation challenges associated with the prioritisation of survival are well captured by the term ‘Organized hypocrisy’ that refers to the discrepancy between an organisation’s stated values or policies and its actual behaviours or practices (Pacheco-Ortiz, Escobar-Sierra and Suárez-Monsalve, 2024). The concept is particularly relevant in organisations that face conflicting demands or pressures from different stakeholders. Brunsson (1989) noted that organisations often engage in organised hypocrisy to manage these conflict demands, by saying one thing and doing another, in effect decoupling their talk from their actions. The benefit is that such an approach allows the organisation to maintain legitimacy and satisfy diverse expectations without fully committing to consistent behaviour.

Christensen, Morsing and Thyssen (2013) highlight how companies may publicly promote ethical standards and sustainability efforts yet engage in practices

that contradict these values. The hypocrisy enables organisations to appear compliant with societal expectations while continuing business as usual. The downside as Wagner, Lutz and Weitz (2009) noted, is that hypocrisy can erode trust and lead to companies being perceived as insincere or deceptive. The concept of “organised hypocrisy” allows political organisations to navigate the pressures and expectations arising from contradictory norms, such as shown in various studies of EU policy, from migration to environmental policy (Lavenex, 2018; Cusumano, 2019; Knill, Steinebach and Fernández-i-Marín, 2020). It is similarly evident in Ireland in the decisions by government policymakers, multinational corporations (MNCs), and SMEs as each try to navigate the complex landscape of long-term environmental goals and immediate business realities.

Emeritus Professor John Sweeney, a researcher on climatology and climate change, reflecting on Ireland’s climate laggard status at COP 24 noted that, “The year 2030 is a nice fuzzy future date, rather like the nebulous ‘net zero by 2050’ targets so beloved of some public and private sector organisations.” Sweeney's remark points to the Irish Government style-over-substance approach, influenced by powerful MNCs and SMEs (Sweeney, 2018). For new and naive policymakers, the influence of experienced MNCs pushing for more lenient regulations, combined with SMEs pushing back against stringent rules that could threaten their survival, can lead to a significant delay in implementing effective measures (Brennan and Power, 2024). The tendency towards procrastination, as Sweeney warns, can have serious consequences for sustainability outcomes, particularly when legal regulations are eventually enforced harshly and uncompromisingly. He notes that in such cases, ideals like “*just transition*” or “*bringing the people with us*” often fall by the wayside, as has been observed in other countries.

2.6.3 Competing Value Framework

Conceptually, the four quadrants of the Competing Values Framework (see Quinn and Rohrbaugh, 1983) (see Quinn and Rohrbaugh 1983) can be associated with differing cultures as identified by Cameron and Quinn (2011). These quadrants, highlight employee behaviour and culture that can restrict or stimulate performance (Zeb *et al.*, 2021), can in turn help identify change leadership opportunities to promote innovation

and shape behaviour (Cameron and Quinn, 2011; Naranjo-Valencia, Jiménez-Jiménez and Sanz-Valle, 2011).

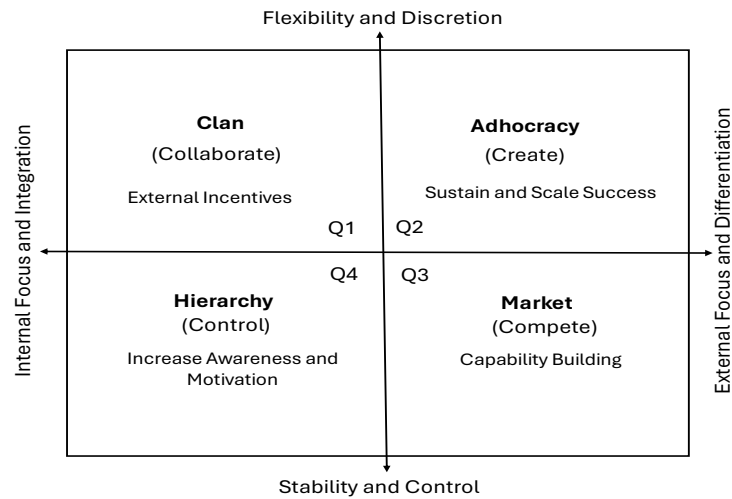


Figure 12. Competing Value Framework (Cameron & Quinn, 2011)

The associated cultural dispositions with the four quadrants are as follows:

- Q1 with an emphasis on internal flexibility focus is categorised as a Clan culture. This culture has a high level of engagement and attaches great value on participation, consensus and teamwork.
- Q2, has an external and flexibility focus is an adhocracy, which is a dynamic, entrepreneurial and creative environment; .
- Q3, emphasises external control that is a Market culture that is goal focused, with leaders demanding and goal-focused, and the style is focused on competition; and finally
- Q4, with an internal control focus is a Hierarchy that is formalised and efficiency oriented. Concern with the long-term is on stability, smooth planning and low costs.

Broadly, clan and adhocracy emphasise flexibility, while hierarchy and market culture emphasise stability. SMEs can be assisted to engage in sustainability using the spatial model of effectiveness criteria, As the model suggests, businesses with a ‘Clan’ culture may have the capability but lack the motive to drive sustainability objectives, with an

‘Adhocracy’ may be willing but lack the resources. Each quadrant suggests tailored strategies that address both internal culture and external factors facing SMEs.

2.7 Theoretical perspectives

2.7.1 Theory of Planned Behaviour (Intention)

The Theory of Planned Behaviour (TPB) is a psychological framework crafted by (Ajzen, 1985, 1991) that aims to predict and understand individuals’ behaviour in a specific context (see Figure 13). It posits that behaviour is directly influenced by behaviour intentions, which are shaped by three key factors: attitudes towards the behaviour (ATB), subjective norms (SN), and perceived behaviour control (PBC). Attitudes refer to the positive or negative evaluation or opinion of performing the behaviour. Subjected norms involve the perceived social pressure to perform the behaviour (Ajzen, 1985). Perceived Behavioural Control (PBC) pertains to the perceived ease or difficulty of performing the behaviour based on past experiences and anticipated obstacles (Ajzen, 1985). This theory has been extensively applied in fields, including health psychology, marketing and environmental studies, to understand and predict behavioural intentions (Ajzen, 1985, 1991).

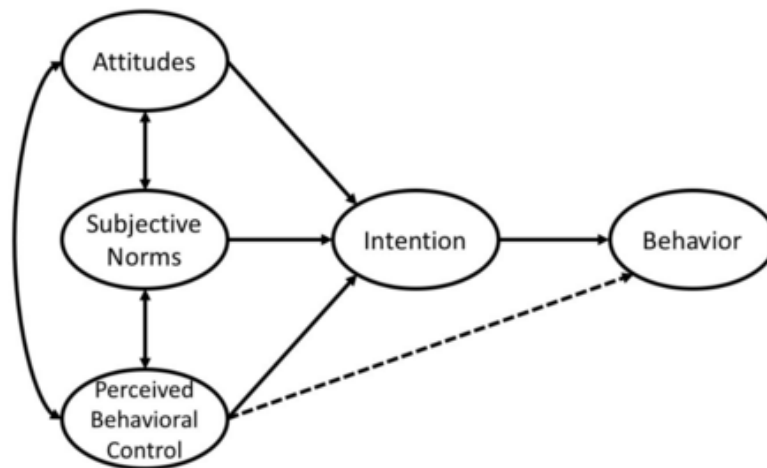


Figure 13. Theory of Planned Behaviour (Ajzen, 1991)

TPB will be used to examine RQ1: *What factors influence the adoption of sustainability practices in SMEs?* TPB is a robust framework tested and used for understanding and predicting human behaviour across various contexts, including pro-environmental actions, e-commerce adoption, and food purchasing decisions. Soyez

(2012) utilised TPB to explore pro-environmental behaviour in international marketing, emphasising that consumers' intention to engage in environmentally responsible actions is shaped by their attitude towards the environment, the perceived social pressure to eco-friendly norms, and their perceived control over such behaviours. Similarly, Cordano et al. (2011) applied TPB to analyse pro-environmental behaviours among students, highlighting that students are more likely to engage in sustainable practices when they believe in their ability to make a difference and perceive strong social support for such behaviours from their peers. In a different application, Chai and Pavlou (2004) employed TPB to examine the adoption of e-commerce technologies, focusing on how business professionals' technology readiness and perceived ease of use over the technology drive their intentions to embrace digital platforms.

Across these many studies, TPB consistently demonstrates its utility in explaining how attitudes, subjected norms and perceived behaviour control influence individuals' intentions to perform that behaviour (Han, Hsu and Sheu, 2010; Hassan, Shiu and Parry, 2016; Goh and Jie, 2019). Furthermore, TPB has been on trend since 2014 in explaining individuals' behavioural intentions and actions in environmental and eco-friendly services Figure 14 shows a bibliometric analysis of TPB. Sustainability has gained further prominence, with studies exploring areas such as recycling behaviours, use of environmentally friendly practices (Kim, Njite and Hancer, 2013), pro-social behaviours (Yuriev et al., 2020a), use of EVs (Wang *et al.*, 2016) and adoption of clean energy (Pakravan and MacCarty, 2020).

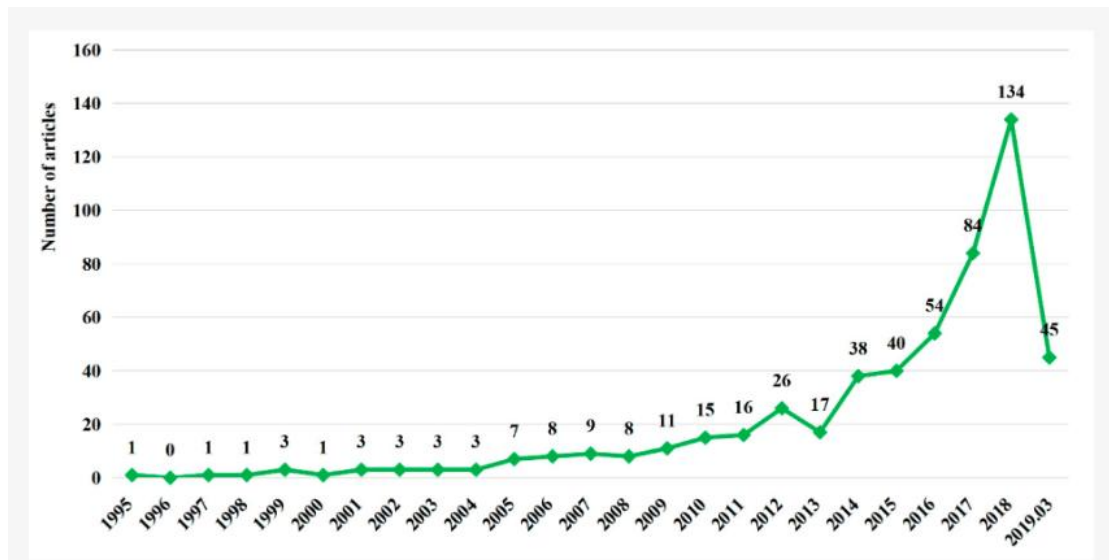


Figure 14. Bibliometric Analysis of Theory of Planned Behaviour (Source: Si et al., 2019)

2.7.2 Interdependency Theory (Behaviour)

Interdependency Theory, formulated by Thibaut and Kelley in 1959, has evolved significantly over the decades (see Thibaut and Kelley, 1959; Kelley et al., 2003b) into a detailed framework for understanding social interactions (Van Lange and Balliet, 2015). This theory posits that the outcomes of interactions between individuals are not solely dependent on one person's actions but are instead a product of the interdependence between the interacting parties (Kelley, 1978; Kelley *et al.*, 2003a; Thibaut, 2017). Interdependencies, for example, in the structure of situations can influence behaviour and lead in the context of uptake of sustainability by SMEs, to (un)sustainable practices such as waiting to see how others behave and using cooperation, competition or individualism to maximise one's outcomes.

The theory has been extended over the past decades, first by Kelley and Thibaut (1978) and then by others, into a comprehensive theory of social interaction. The theory is underpinned by four key principles (Stroebe *et al.*, 2012):

The principle of Structure (The Situation): This principle focuses on the context in which interactions occur, emphasising that the structure of the situation dictates the nature of the interdependence between individuals. It involves understanding the payoff matrix or the potential outcomes that each participant might receive based on the interaction.

The Principle of Transformation: Transformation refers to how individuals interpret the structure of the situation and choose to act within it. This principle highlights the cognitive and motivational processes that lead individuals to transform an objective situation into a subjective one, influencing their decisions and behaviours.

The Principle of Interaction: Interaction is shaped by both the individuals involved and the objective features of the situation. This principle asserts that the behaviour of each person in an interaction is determined not just by their preferences and characteristics but also by the expectations, actions, and responses of the other parties involved.

The Principle of Adaptation: This principle suggests that through repeated interactions, individuals develop stable patterns of behaviour or orientations. These patterns reflect adaptations to the types of situations encountered, guiding future behaviour in similar contexts. Over time, these adaptations contribute to the development of enduring social roles and relationships.

Interdependence theory will be the basis for examining RQ2: : *What actor and environmental factors influence sustainability practice behaviour in Irish SME*, in conjunction with social capital theory and structuration theory that is both latterly used to progressively explain the grounded models in Chapter 6. . Interdependence theory, which has been used in numerous sustainability-related studies (see for example Kumar and Datta, 2021; Keser, 2023) offers a valuable lens for understanding how factors influence the adoption of sustainable behaviours by SMEs.

Just as individuals are interdependent with nature—where the health of the environment directly impacts their well-being—SMEs are similarly interdependent with the broader ecological and economic systems in which they operate (Davis, Green and Reed, 2009). This suggests that the commitment to sustainability practices by SMEs is influenced by its recognition of mutual dependence to fulfil long-term needs. Research has traditionally focused on commitment to specific behaviours, such as adopting green practices, as a primary driver of environmental actions. However, commitment to sustainability as a broader relationship—represents a deeper and more influential construct (Van Lange *et al.*, 1997; Davis, Green and Reed, 2009). In this view, the natural environment and the SMEs form a relationship where the businesses experience varying degrees of commitment, influenced by how much they rely on the environment for their operational needs and long-term success.

Interdependence theory provides a comprehensive framework for understanding this dynamic. The theory suggests that the structure of a relationship—such as that between SMEs and the environment—over time, can affect the motivation and behaviour of the parties involved. SMEs that recognise their dependence on a healthy environment for business longevity are more likely to develop a strong commitment to sustainable principles. Thus, a long-term orientation towards environmental stewardship, and a consistent effort to integrate sustainability into business operations are highlighted (Rusbult and Arriaga, 2000; Kelley et al., 2003b; Rusbult and Van Lange, 2008). SMEs may adopt sustainability practices that benefit both the business and the environment, even at the expense of short-term profits (Islam, Tseng and Karia, 2019). This transformation is evident in both their mindset and actions, as these businesses often treat success and environmental responsibility as intertwined goals. They are more likely to prioritise long-term sustainability over immediate financial gains (Vaske and Kobrin, 2001).

2.7.3 Social Capital Theory

Social Capital Theory (SCT) is a conceptual framework that examines the value embedded in social relationships and networks (Dubos, 2017). Originating from sociology and economics, this theory posits that the relationships and connections individuals or entities have within a community or network contribute to the creation of social capital (Kreuter and Lezin, 2002). Social capital encompasses the trust, norms and reciprocity that arise from these connections, fostering collaboration, information exchange and collective action.

Social capital is commonly recognised as a comprehensive concept focusing on individuals' behaviours, attitudes, and predispositions (Clark, 2015). It involves social processes associated with connectedness and the resulting attachments among individuals (Carpiano, 2006). Two primary forms of social capital are distinguished: bonding (or exclusive) and bridging (or inclusive) capital (Hawkins and Maurer, 2010; Woolcock, 2010; Saw, 2020) See Figure 15. Both types involve horizontal social relations that foster solidarity within similar people or social groups, as well as distant connections across social divides. A third form, linking capital, characterises vertical relationships with weak ties to acquaintances or sparse heterogeneous networks (Woolcock, 2010; Saw, 2020). Horizontal and vertical ties collectively contribute to

the development of broader social identities and reciprocity across diverse groups. Notably, weak ties, particularly those linking individuals to distant acquaintances, prove most valuable when seeking employment opportunities (Kwon and Adler, 2014).

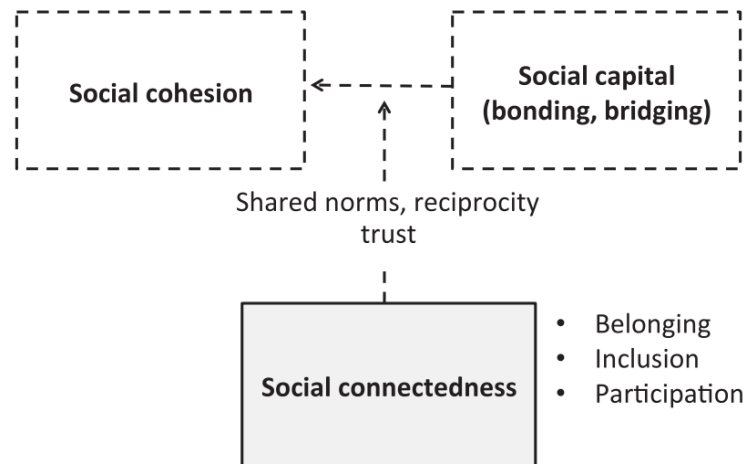


Figure 15. Social Cohesion, Capital and Connection (Thomas & Griffin, 2023)

Thomas and Griffin (2023) delineated two distinct paradigms in the realm of cooperation and competition. The disparities between these paradigms stem from the type of advantage conferred, specifically whether it is personal or involves more effective transactions across fields. The beneficiaries of these paradigms are categorized as either individuals or communities. The first view, epitomized by Putnam (2000), underscores cooperation for the common good; the second view is that social capital is a resource intricately linked to networks that simultaneously restrict certain individuals while favouring others (Bourdieu, 2018). This latter perspective identifies competition as primary for the collective resources of groups by their members, albeit with elements of cooperation integrated.

In the context of SMEs, social capital theory helps understand the many interconnected dynamics in business environments. SMEs often operate in close-knit communities where interpersonal relationships and networks are paramount (Russo and Perrini, 2010). This makes social capital particularly relevant for SMEs. It influences their ability to access resources, navigate challenges, and capitalize on opportunities. Moreover, it flags that success is not solely dependent on financial capital. Rather, social networks that SMEs build can be instrumental, while structural

ties with local communities and industry networks can also provide valuable resources such as information, financial support, and collaborative partnerships. The extent to which cohesive relationships and connections are cultivated within SMEs holds significant implications for operational resilience, resource access, and adaptive capacity (Guerrero, Cayrat and Cossette, 2022; Ozanne et al., 2022). This nexus highlights the importance of the relationships (Clarke, Chandra and Machado, 2016; Kraus *et al.*, 2022) that related literature suggests can contribute to resilience and adaptability of SMEs in dynamic business environments (Thomas and Griffin, 2023).

2.7.4 Structuration Theory

Turning lastly to structuration theory, developed by sociologist Anthony Giddens and extended (Stones and Jack, 2016), this theory offers a framework to understand the dynamic relationship between individual agency and social structures in the qualitative analysis. Giddens (1984) posits that social structures are not merely external forces that constrain individual actions but are also the medium through which human action is produced and reproduced over time. This theory introduces the concept of the "duality of structure," where structures are both the product of human actions and the context within which these actions take place. In this sense, individuals are not only influenced by the social structures around them but also actively contribute to the shaping and reshaping of these structures through their daily practices.

Structuration theory, where individual agency interacts with broader social structures, provides a way to bridge the gap between macro-level social structures and micro-level individual actions in the analysis and discussion stages in Chapters 5 and 6. As emphasised by Giddens, social activity is the result of an ongoing process of social reproduction and change (Giddens, 1984). Arguably, the uptake of sustainability practices in businesses can be helped when seen through the lens of structuration theory. Entrepreneurs are not only influenced by existing environmental, social and economic structures but also actively shape and modify these structures through their sustainability initiatives (El Ebrashi, 2013). According to the theory, structures are both the medium and outcomes of social practices, meaning that as small business owners adopt and innovate sustainability practices, they simultaneously reinforce and transform the frameworks that govern business operations (Sarason and Dean, 2019).

This duality suggests that sustainability is not just a set of external requirements imposed on businesses but is also actively constructed and reconstructed by SMEs through their daily actions and decisions. These businesses, motivated by a range of economic and non-economic goals, navigate the complexities of resource allocation, market demands, and regulatory environments to balance profitability with social and environmental responsibility (Gonin, Besharov and Smith, 2013; Smith, Gonin and Besharov, 2013). In essence, the adoption of sustainability in business is a dynamic process wherein agents actively engage with and alter the structure around them, while their actions are simultaneously shaped by the temporal-spatial contexts in which they operate (Steinerowski and Steinerowska-Streb, 2012).

The conceptual framework proposed for this study is shown in Figure 16. The framework builds on two primary theoretical perspectives, TPB and Interdependence Theory to respectively address RQ1, factors related to the adoption (or intention to uptake) of sustainability practices by Irish SMEs and subsequently RQ2 which examines actual behaviour, including possible synergistic, conflicting and retrograde influences.

TPB is a well-tested framework for understanding how attitudes, subjected norms, and perceived behaviour control can predict the intention and behaviour of business owners in the uptake of sustainability practices. However, TPB has certain limitations, particularly in terms of explaining the gap between individuals' positive attitudes and their actual behaviour. As highlighted by Joshi and Rahman (2015), a favourable attitude towards sustainability does not always lead to consistent sustainable actions. This gap indicates the need to seek better explanations, such as situational, informational and temporal factors including ethical values, ingrained consumption patterns, and the influence of the external environment, which affect actual behaviour but are not adequately explained by TPB. The external environment, including social, economic, and regulatory contexts, all play a significant role in shaping how attitudes are translated into real-world sustainable practices. Hence, RQ2 is an exploratory study of attitudes and behaviour (and impact) reflecting the contextual influences on adoption. The analysis is based on the Interdependence Theory (Kelley, 1978; Thibaut, 2017).

The qualitative exploration is supported in later analysis using Structuration Theory (Giddens, 1984) and is applied to understand the dynamic interaction between agency and structure, which is illustrated by the popular four-quadrants approach used by the Competing Value Framework (Quinn *et al.*, 1991). Understanding that the interconnectedness of stakeholders and the environment can shape behaviours, interdependence theory helps explain the relationships and mutual dependencies within and between businesses and the external environment that influence sustainability decisions. Addressing the limitations of TPB, these secondary social theories were chosen because they provide a comprehensive lens through which to understand the complexities of actual behaviour, by considering broader social, relational, and organisational factors that influence decision-making and behaviour in SMEs (Schwarzer, 2014; Sniehotta, Presseau and Araújo-Soares, 2014).

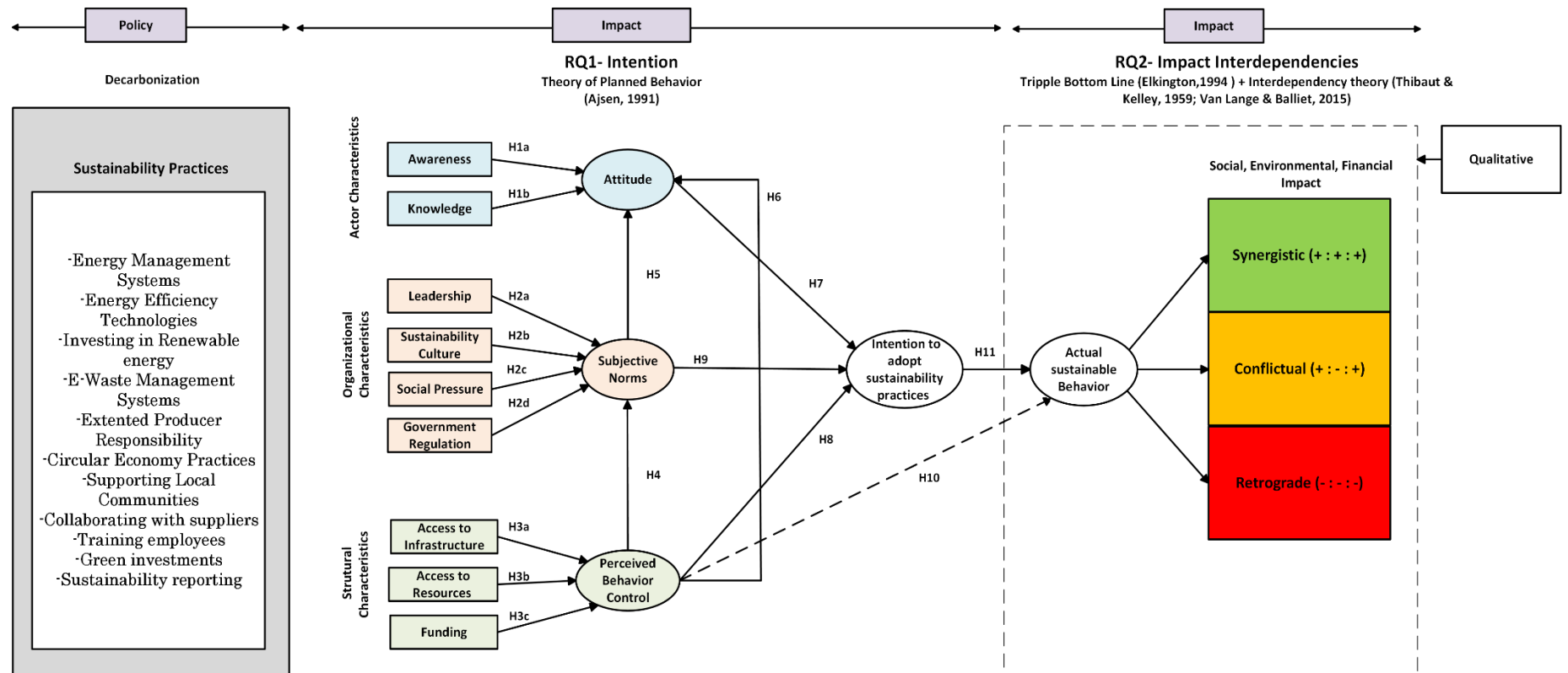


Figure 16. Conceptual Framework

2.8 Chapter Two Summary

This chapter outlined literature related to sustainability, sustainable development and sustainability practices in general and in (Irish) SMEs. The chapter commences with an overview of the significance of sustainability, shedding light on the growing global awareness of environmental and social issues, and the increasing emphasis on corporate responsibility and sustainable business practices. It underscores the role of SMEs in the Irish economy and their potential for contributing to sustainable development. The review examined the determinants and motivations underpinning sustainability practices in Irish SMEs. Factors such as economic incentives, regulatory pressures, and societal expectations are discussed, and the role of strategy planning, leadership and culture are highlighted.

The literature review next examines the specific sustainability dimensions needing to be addressed by SMEs: environmental (planet), social (people), and economic (profit) aspects. It outlines the various strategies and tools utilised for sustainability management, including the implementation of sustainable supply chains, energy efficiency measures, and corporate social responsibility (CSR) activities. The challenges faced in integrating sustainability into SME operations, such as resource constraints, lack of awareness, and difficulties in measuring sustainability performance, are also noted. As well, the chapter highlights the contextual factors relevant to the Irish business landscape that impact sustainability practices. It highlights Ireland's unique economic and regulatory conditions, including the shadow of hard targets in the context of prevailing organised hypocrisy, and the implicit effects of context on SMEs' sustainability efforts.

This review lays the groundwork for the subsequent empirical research in this thesis concerned with sustainability practice uptake by Irish SMEs. Building on the core ideas and associated theoretical perspectives, TPB and Interdependence Theory, in conjunction with social capital theory and structuration, helped identify a conceptual framework (Figure 16) for the examination of sustainability practices by SMEs. The literature positively highlights the growing importance of the SDGs and sustainability, and a realisation also that SMEs have a role as some targets necessarily must be implemented locally, and that innovation is a fundamental driver.

Chapter 3: Hypothesis Development

3.1 Introduction

Chapter 2 summarised sustainability research and associated theories and introduced the conceptual framework (Figure 16) that guides the examination of the two research questions. This chapter outlines the hypotheses development related to RQ1: business owners' intention to adopt sustainability practices and subsequent behaviour, the quantitative element of the research design related to individual (owner) attitudes, organisational norms, and wider structural characteristics.

3.2 Hypothesis Development

Eleven (11) hypotheses are developed as depicted in Figure 17 a modified version of the conceptual framework. These eleven hypotheses systematically outline anticipated relationships among variables, thereby providing a structured framework for the subsequent empirical investigation.

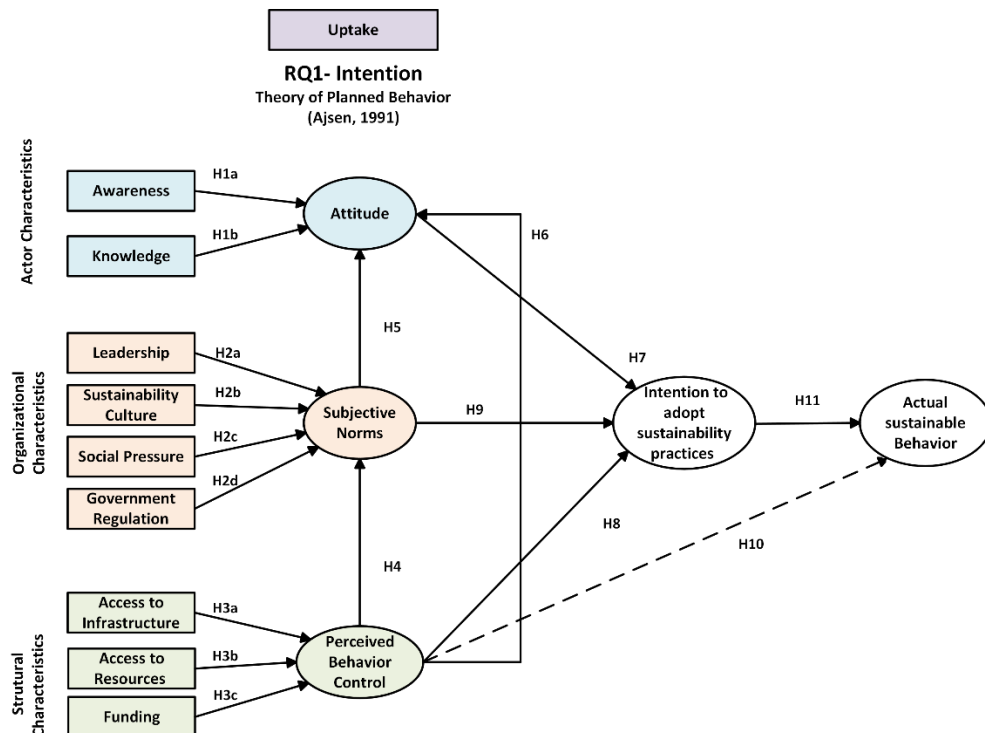


Figure 17. RQ1 - Conceptual Model

3.2.1 Individual Characteristics

Individual characteristics considered in this study consist of three variables: awareness, commitment, and knowledge. This is the first dimension of the proposed conceptual model. Individual characteristics are crucial in understanding human behaviour and decision-making processes, particularly in contexts related to environmental studies (Camuffo *et al.*, 2020; De Winnaar and Scholtz, 2020). Other studies suggest that by considering these individual attributes, researchers and policymakers can gain valuable insights into the factors that drive pro-environmental behaviours and inform targeted interventions (Camuffo *et al.*, 2020; Cleveland, Robertson and Volk, 2020; Al Nuaimi, Singh and Harney, 2021; Chin *et al.*, 2021).

Additionally, understanding individual characteristics allows for the development of tailored strategies that resonate with specific audience segments, fostering greater engagement and participation in sustainability initiatives (Gustafsson, 2006; Al Nuaimi, Singh and Harney, 2021). Therefore, recognising and accounting for individual characteristics is essential for effectively addressing environmental challenges and promoting a collective shift towards more sustainable lifestyles (Crick, Crick and Chaudhry, 2020).

3.2.1.1 Awareness

Environmental awareness plays a pivotal role in shaping individual attitudes towards sustainability (Rustam, Wang and Zameer, 2020). Studies have demonstrated that heightened environmental awareness fosters more positive attitudes and an inclination to sustainable behaviours (Becker, 1978; Katzev and Johnson, 1984). As individuals become more mindful of environmental issues, they tend to develop a greater sense of responsibility and concern for the planet, consequently influencing their attitudes toward adopting sustainable practices (Thoradeniya *et al.*, 2015; Ahmed *et al.*, 2021). This awareness not only informs individuals about the consequences of their actions on the environment but also prompts them to reconsider their behaviour and choices in favour of more eco-friendly alternatives (Heydari, Govindan and Basiri, 2021). Van Birgelen, Semeijn and Keicher (2009) emphasised and confirmed the correlation between environmental awareness of eco-friendly purchase and disposal intentions of beverages. The study revealed a positive relationship between the environmental

awareness of consumers and the eco-friendliness of their attitudes towards beverage consumption and disposal.

Yusup et al. (2015) highlights the predominance of cleaner production strategies, as well as SMEs' transition to sustainability, which is influenced by the owner/managers' environmental awareness. Awareness of environmental issues and concern for the state of the environment predicts a favourable disposition towards pro-ecofriendly intentions and behaviours (Kim *et al.*, 2019). Therefore, environmental awareness serves as a crucial precursor to shaping attitudes conducive to embracing sustainability, thereby motivating individuals to engage in pro-environmental behaviours (Fu *et al.*, 2020; Gurbuz, Nesirov and Ozkan, 2021; Han *et al.*, 2021).

H1a: Environmental awareness is positively related to the attitude towards sustainability practices.

3.2.1.2 Knowledge

Environmental knowledge encompasses both factual understanding and awareness of environmental issues, gained through formal education, personal experiences, media exposure, and societal influences (Ardoin, Bowers and Gaillard, 2020; Fawehinmi *et al.*, 2020). Formal education, particularly environmental science curriculum, has been identified as a significant determinant of environmental literacy (Merritt et al., 2022). Moreover, individuals with higher levels of education tend to possess greater environmental knowledge (Jaime *et al.*, 2023). However, environmental knowledge is not solely reliant on formal education; informal sources such as media, community engagement, and personal experiences also play a pivotal role in shaping perceptions (Ardoin, Bowers and Gaillard, 2020; Merritt et al., 2022).

Scholars have investigated the link between environmental knowledge and attitudes towards sustainability extensively. Empirical evidence suggests that a positive correlation between environmental knowledge and pro-environmental knowledge exists (Paço and Lavrador, 2017; Rustam, Wang and Zameer, 2020). The notion that environmental knowledge enables people to reflect on their actions rationally and then to act intentionally has been dominant in environmental education (Temminck, Mearns and Fruhen, 2015). Scholars suggest that individuals with higher levels of knowledge demonstrate greater concern for environmental issues, exhibit

more sustainable behaviours, and express stronger support for environmental policies (Arcury, 1990; Taufique, Vocino and Polonsky, 2017). Furthermore, environmental knowledge catalyzes attitude formation, influencing individuals' beliefs, values, and perceptions of environmental risks (Arcury, 1990; Bradley, Waliczek and Zajicek, 1999; Paço and Lavrador, 2017).

H1b: Environmental knowledge is positively related to the attitude towards sustainability practices.

3.2.2 Organisational Characteristics

Organisational characteristics encapsulate the fundamental attributes and features that define the structure, culture, and operations of an organisation. The organisational characteristics considered in this study consist of—leadership, sustainability culture, social pressure, regulation compliance and government regulation.

Organisation characteristics profoundly influence the behaviour and performance of an organisation, shaping its ability to adapt to internal and external dynamics, achieve strategic objectives, and respond to stakeholder needs (Collins *et al.*, 2007; Isensee *et al.*, 2020; Crossley, Elmagrhi and Ntim, 2021). Moreover, these attributes play a pivotal role in fostering innovation, promoting employee engagement, and cultivating a positive organisation climate (Williams and Schaefer, 2013b). By understanding and leveraging organisational characteristics, business owners can effectively design and implement strategies that enhance organisational effectiveness, resilience, and sustainability in today's competitive business environment (Moore and Manring, 2009; Williams and Schaefer, 2013a; Wiesner, Chadee and Best, 2018; Isensee *et al.*, 2020).

3.2.2.1 Leadership

Leadership is a multifaceted concept that has been explored through various lenses, particularly from psychological and management perspectives (Elkins and Keller, 2003; Parris and Peachey, 2013; Macke and Genari, 2019). In sustainability, several leadership and management paradigms are evident, such as stakeholder leadership, responsible leadership, ethical leadership, sufficiency economy philosophy in business, and sustainable leadership (Maak, 2007; Agarwal and Bhal, 2020; Jiang *et*

al., 2020; Piwowar-Sulej and Iqbal, 2023). While these approaches share goals of advancing sustainability, they diverge in their theoretical underpinnings and practical applications (Janeiro and Patel, 2015). For instance, stakeholder-based leadership integrates stakeholder management with triple-bottom-line frameworks, emphasizing a balance in economic, social, and environmental interests (Freeman *et al.*, 2010). In contrast, ethical leadership underscores the importance of governance and ethical practices in driving sustainability (Burawat, 2019).

Within small businesses, the leadership prowess of the entrepreneur assumes paramount importance, given that the entrepreneur often serves as the owner-manager, wielding authority over the allocation and utilization of business resources (Suriyankietkaew, 2019). In recent decades, scholarly interest in leadership within SMEs has surged, reflecting the growing recognition of its pivotal role in organisational success (Ranabahu and Wickramasinghe, 2022). Central to this discourse is the role of strategic leadership (thinking long-term) in driving sustainability initiatives within SMEs. It is argued that effective leadership in this context extends beyond setting sustainable goals. It also involves fostering a pervasive culture of environmental and social responsibility throughout the organisation (Jardon and Martínez-Cobas, 2019). Hargreaves and Fink (2007) articulate the essence of what is termed 'sustainable' leadership, as meeting the needs of the present society without compromising the ability of future generations to thrive, as a collaborative style, rather than a hierarchical approach. Such an approach is most suited to considering long-term sustainability as an intricate, interconnected living system (Parris and Peachey, 2013; Muralidharan and Pathak, 2018).

Sustainability-oriented leadership in SMEs encompasses a spectrum of actions, including the advocacy for strategy, sustainable practices, the integration of sustainability considerations into decision-making processes, and the cultivation of eco-friendly behaviours among employees (Janeiro and Patel, 2015; Piwowar-Sulej and Iqbal, 2023). Therefore, leadership plays a pivotal role in setting the tone for acceptable norms and behaviours within an organisation through actions, decisions, and communication styles (Burawat, 2019). Business owners through their leadership practices, can inspire trust, foster collaboration, and promote ethical behaviour. Ultimately, effective leadership can influence subjective norms by shaping the

perception of what is considered appropriate and desirable behaviour within the organisational context (Maak, 2007; Muralidharan and Pathak, 2018; Burawat, 2019; Mackey *et al.*, 2021).

H2a: Leadership positively influences subjective norms.

3.2.2.2 Sustainability Culture

Sustainability culture refers to the values, beliefs, norms, and practices that prioritises sustainable and responsible action (Linnenluecke and Griffiths, 2010). According to Caprar and Neville (2012) “culture is the antecedent, of the condition, influencing the adoption of sustainability.” Furthermore, several other studies (Van Marrewijk and Werre, 2003b; Ho, Wang and Vitell, 2012; Hahn *et al.*, 2015a) identify and link culture as a crucial significant exploratory factor for variances linked to sustainability. This culture is important in businesses as it guides decision-making and behaviour towards sustainable practices, both internally and externally (Millar and Gitsham, 2013; Grayson, Coulter and Lee, 2018).

According to Lozano (2008), developing a sustainability culture within a business involves more than just adopting environmental best practices. It requires a fundamental shift in the way an organisation operates, encompassing environmental, social and economic considerations (Dyck, Walker and Caza, 2019). This includes integrating sustainability into core business strategy, supply chain management, product development, and stakeholder engagement (Gupta and Kumar, 2013; Galpin, Whittington and Bell, 2015). Research suggests that a robust sustainability culture influences social norms by establishing expectations and standards for environmentally and socially responsible behaviour within the organisational context (Marshall *et al.*, 2015a; Isensee *et al.*, 2020; Ketprapakorn and Kantabutra, 2022).

As employees observe sustainability practices being prioritised and rewarded, they are more likely to internalize these norms and incorporate them into their own decision-making processes (Miska, Szöcs and Schiffinger, 2018). This internalisation of sustainability norms extends beyond the organisation, as employees carry these values and behaviours into their broader social networks, influencing peers, suppliers, and customers (Howard-Grenville, 2006; Kantabutra and Ketprapakorn, 2020). Consequently, organisations with a strong sustainability culture contribute to the

diffusion of sustainability practices through society and foster a broader shift towards sustainable business practices (Pennington and More, 2016).

H2b: A strong sustainability culture within an organisation positively influences subjective norms.

3.2.2.3 Social (User) Pressure

Social norms are “rules and standards” that are understood by members of a group, and that guide and/or constrain human behaviour without the force of law (Elster, 1989; Chung and Rimal, 2016). In general, social norms are what is commonly accepted or rejected in society (Sunstein, 1996). These social norms are shaped by, and shared through, interactions between and among different social groups (family members, friends, business partners, etc) and become the unwritten rules for the conduct of that group (Anderson, 2000). As Conduit, Karpen and Willmott (2023) remark, there is a lack of research investigating the user perspective in the circular economy. The user can tend to be a passive recipient of a service or product rather than a co-creators of value (Conduit, Karpen and Willmott, 2023). Similarly, other research has recognised the opportunity for users (citizens) to become integrated into policy planning (Repo *et al.*, 2018).

Customer or user social pressure can play a significant role in shaping social norms and driving the adoption of sustainability practices within organisations (Marshall *et al.*, 2015b; Everard, Reed and Kenter, 2016). Studies suggest (Park and Ha, 2012; Hosta and Zabkar, 2021) that as consumers become increasingly aware of environmental and social issues, they exert pressure on businesses to align their practices with sustainability values (Khan *et al.*, 2021). This pressure can manifest in various forms, including demands for eco-friendly products, calls for transparency in supply chains, and expectations for corporate social responsibility (CSR) initiatives (Babiak and Trendafilova, 2011). Organisations that fail to meet these expectations risk reputational damage and loss of market share (Contini *et al.*, 2020). Consequently, businesses may be compelled to conform to sustainability norms established by consumer preferences to maintain a competitive position and brand reputation (Alamsyah, Othman and Mohammed, 2020; Zameer, Wang and Yasmeen, 2020). Notably, other research, a literature review of SDGs and innovation offers a conflicting

view: that greater market share and profits were the realised benefit of uptake of sustainability and that pressure of employees and consumer associations was far less important (see Cordova and Celone 2019).

Customer (social) pressure can also influence broader societal norms by shaping perceptions of what constitutes acceptable behaviour, thereby, encouraging other businesses to adopt sustainability practices to meet evolving consumer needs (Han, 2021). Research in this domain has explored various aspects related to the influence of consumer preferences on CSR strategies (Kuokkanen and Sun, 2020), the role of consumer activism in promoting CSR (Banerjee, Homroy and Slechten, 2022), and the impact of sustainability communication on consumer perceptions and purchasing behaviour (Lin and Niu, 2018; Kim *et al.*, 2019).

H2c: Social pressure positively influences subjective norms.

3.2.2.4 Government Regulation

Government regulations often establish environmental standards and mandate businesses to adhere to sustainability criteria (Aragón-Correa, Marcus and Vogel, 2020). These regulations play a crucial role as they provide a legal framework that influences organisational behaviour and sets norms within society (Leenders and Chandra, 2013). SMEs, as significant contributors to the European economy, are profoundly impacted by regulatory measures (Redondo Alamillos and de Mariz, 2022). As literature also informs, identifying incentives, support programs and technical assistance, regulations can help cultivate a culture of environmental responsibility in SMEs and encourage the adoption of sustainability initiatives (Kinderman, 2020; Wang, Chu and Hao, 2024).

Across many countries, regulations have been imposed on individuals, companies, and organisations to safeguard ecosystems from harm. The enforcement of such environmental regulations has compelled companies to explore innovative solutions to protect the environment (Leenders and Chandra, 2013; Wang, Chu and Hao, 2024). Additionally, Liao and Tsai (2019) and Frigon, Doloreux and Shearmur (2020) have underscored that environmental policies compel businesses to implement green practices. When regulations prioritise environmental protection and sustainability, they communicate the significance of these values to individuals and

organisations, thereby influencing societal attitudes and behaviours (Arcury, 1990; Paço and Lavrador, 2017). Government intervention and regulations are crucial for fostering ecological innovation and promoting green practices, which directly alleviate environmental pressure and contribute to sustainable development (Van Leeuwen and Mohnen, 2017).

H2d: Government regulation influences social norms.

3.2.3 Structural Characteristics

Resource-based characteristics encompass the essential assets and capabilities that define an individual, organisation, or entity's capacity to achieve its goals and objectives effectively (Estensoro *et al.*, 2022). These characteristics encompass the tangible and intangible assets that underpin an organisation's ability to integrate environmental, social and governance (ESG) considerations into its operations. Tangible resources include investments in eco-friendly technologies, renewable energy, smart appliances, and sustainable supply chains, while intangible resources include a skilled workforce, innovative capabilities, and an ethical culture.

Access to funding for sustainable initiatives, adequate infrastructure for eco-efficient operations, and a commitment to responsible resource management are pivotal in driving the adoption and implementation of sustainability practices (Aragón-Correa *et al.*, 2008; Terziovski, 2010; Darcy *et al.*, 2014). By leveraging these resource-based characteristics effectively, businesses can enhance their competitive advantage, mitigate risks, and contribute to long-term value creation while advancing sustainability goals (Ramon-Jeronimo, Florez-Lopez and Araujo-Pinzon, 2019; El Nemar *et al.*, 2022). Access to and utilisation of these resources are critical determinants of an organisation's competitive advantage. The resource-based characteristics considered in this study consist of access to infrastructure, resources and funding.

3.2.3.1 Access to Infrastructure

Infrastructure encompasses a spectrum of physical, technological, and organisational resources necessary for implementing sustainability practices (Fernández and Camacho, 2016). Scholars suggest that access to appropriate infrastructure facilitates

the implementation of sustainable practices by providing essential support mechanisms such as waste management systems, energy-efficient technologies and transportation networks (Zhang, Li and Ziegelmayer, 2009). This significance stems from the fact that access to infrastructure contributes to the establishment of a more efficient and effective business environment, enabling businesses to operate at their full potential, thereby improving faster delivery times, optimising order processing systems and fostering better communication between suppliers and customers (Gäre and Melin, 2011; Mc Namara, Murro and O'Donohoe, 2017). Moreover, infrastructure accessibility holds the potential to yield long-term cost reductions by streamlining processes and minimizing waste, thereby leading to savings across various operational expenses such as transportation expenses and energy bills (Mushtaq, Gull and Usman, 2022). Consequently, these accrued savings can be reinvested back into the business, further augmenting sustainability efforts (Andrieş *et al.*, 2018).

H3a: Access to infrastructure positively influences perceived behaviour control.

3.2.3.2 Access to Resources

Access to resources serves as a fundamental enabler for SMEs in adopting sustainability practices. Resources encompass financial, human, and natural capacity for integrating sustainability into business operations. According to Hahn *et al.* (2015b), access to financial resources facilitates investments in sustainable technologies, processes, and certifications. Additionally, human resources play a vital role in driving sustainability initiatives through training, skill development, and fostering a culture of environmental responsibility as highlighted by (Shahzad *et al.*, 2020). Moreover, access to natural resources, such as renewable energy sources and sustainable sources of materials, is essential for minimizing environmental impacts and promoting resource efficiency (Hahn *et al.*, 2018). For SMEs, often faced with challenges in resource availability, accessing these resources can be challenging. Therefore, policies and initiatives aimed at enhancing access to financial support, knowledge transfer, and sustainable supply chains are crucial for enhancing SMEs to embrace sustainability practices effectively (Jabbour *et al.*, 2020; Bertello *et al.*, 2022). Hence, the following hypothesis:

H3b: Access to resources positively influences perceived behaviour control.

3.2.3.3 Access to Funding

Access to funding plays a pivotal role in enabling SMEs to uptake sustainability practices (Brav, 2009). Multiple scholars affirm that adequate funding is essential for SMEs to implement sustainability initiatives, providing essential capital eco-friendly equipment procurement, energy audits, and waste management system implementation (Osano and Languitane, 2016). Furthermore, financial resources support research and development endeavours directed towards sustainability innovation (Lee, Sameen and Cowling, 2015). Access to green funds helps SMEs offset initial costs associated with transitioning to sustainable practices, thereby mitigating financial barriers to adoption (Cecere, Corrocher and Mancusi, 2020; Thomas, Scandurra and Carfora, 2022). Studies suggest that government support for pro-environmental initiatives acts as a catalyst for positive changes in consumer behaviour, eco-competition, and eco-managerial practices within businesses (Lee, Sameen and Cowling, 2015; Cecere, Corrocher and Mancusi, 2020; Chien *et al.*, 2021; Cowling and Liu, 2021). Furthermore, external support such as subsidies are crucial for SMEs to enhance their sustainability programs and financial health. Thus, external support, such as access to funding, encourages SMEs to embrace sustainability practices.

H3c: Access to funding positively influences perceived behaviour control.

3.2.4 Intentions and Actual Behaviour

The Theory of Planned Behaviour (TPB) posits that intentions are significant predictors of behaviour and play a crucial role in influencing individuals' actions (Hersey and Blanchard, 1969). According to TPB, intentions are determined by three key factors: attitude towards the behaviour, subjective norms and perceived behaviour control (Ajzen, 1985). Hersey et al., (2007) suggest that individual behaviour depends upon behavioural intention and behavioural control. Thus, the PBC and intention to adopt sustainability practices determine the actual sustainable behaviour of SME owners. A meta-analysis study conducted by Klöckner (2013) examined several common theories in environmental psychology and confirmed that intention was the

strongest predictor of behaviour. In addition, previous studies conducted by (Donald, Cooper and Conchie, 2014; Li *et al.*, 2018; Fang and Zhang, 2019) revealed that, as a mediator to TPB, the intention was the most important antecedent variable predicting actual behaviour. Furthermore, in sustainability literature, there has been a strong and positive link between PBC and behavioural intention. For example, recycling. Huang *et al.*, 2022), green products (Arlu *et al.*, 2018) and water conservation (Warner and Diaz, 2021). Hence, the observation contributes to the following hypotheses:

H4 Perceived behaviour control positively influences subjective norms.

H5 Subjective Norms positively influence attitude towards sustainability practices.

H6 Perceived behaviour control positively influences attitude toward sustainability practices.

H7 Attitude positively influence the intention to use sustainability practices.

H8 Perceived behaviour control positively influences the intention to use sustainability practices.

H9 Subjected Norms positively influence the intention to use sustainability practices.

H10 Perceived behaviour control positively influence actual adoption behaviour

H11 The intention to adopt sustainability practices positively influences actual adoption behaviour.

3.3 Chapter Three Summary

Chapter 3 provided an overview of the hypothesis development in relation to RQ1. The chapter systematically explored each variable under investigation, drawing on current literature to justify their inclusion and to build a strong theoretical foundation for the proposed hypotheses. The literature reviewed addresses key concepts, theories,

and empirical findings related to the variables, and highlights gaps and inconsistencies that the current research might address. By integrating insights from prior research, the chapter established clear, testable hypotheses that are aligned with the study's research questions and objectives, setting the stage for the empirical analysis to follow.

Chapter 4: Research Methodology

4.1 Introduction

The journey towards sustainability by Irish SMEs is comparatively underexplored, in contrast to large corporations as discussed in Chapter 2 (Nygaard, Kokholm and Huulgaard, 2022; Smith *et al.*, 2022). This chapter presents the philosophical framework and methodology supporting the study of sustainability practice uptake and implementation by SMEs in Ireland. The purpose of this chapter is to outline the context and rationale behind the chosen methodology, followed by a comprehensive review of the data collection methods, both quantitative (QUANT) and qualitative (QUAL), and analytical strategies employed to answer each research question. Finally, the reliability and validity of the collected data and ethical considerations relevant to the research, are discussed.

4.2 Research Objectives

The focus of this study is developing a better understanding of SME challenges and opportunities and extending this understanding towards activating the collective potential as environmental agents that could be powerful (Smith *et al.*, 2022). The two research questions (RQs) and associated research objectives (ROs) were identified in Chapter 2. In summary, the RQs are:

- RQ1 examines actor-specific characteristics, organisational traits and resource-based dynamics that influence decision-making processes within SMEs, while
- RQ2 is an exploratory study of interdependencies involved in advancing sustainability practices and balancing social, environmental, and economic considerations. This latter RQ delves into the interplay between the three dimensions of Planet, People and Profit, while the objective is to explore how Irish SMEs can be nudged towards optimized uptake of sustainability practice.

4.3 Research Framework

There is no universal definition of a research framework as it can vary across disciplines and thematic fields (Cox *et al.*, 2016). In effect, the research framework encompasses the philosophical worldview, theoretical underpinnings, methodological approach, and analytical framework employed to address the research objectives and hypotheses (Nagel and Partelow, 2022). Additionally, it often incorporates relevant theories, models, and prior empirical findings to provide a theoretical foundation for the study (Creswell, 2014) The subsequent section will discuss all these elements of research and the rationale for choosing specific methods and approaches for the study based on Figure 18.

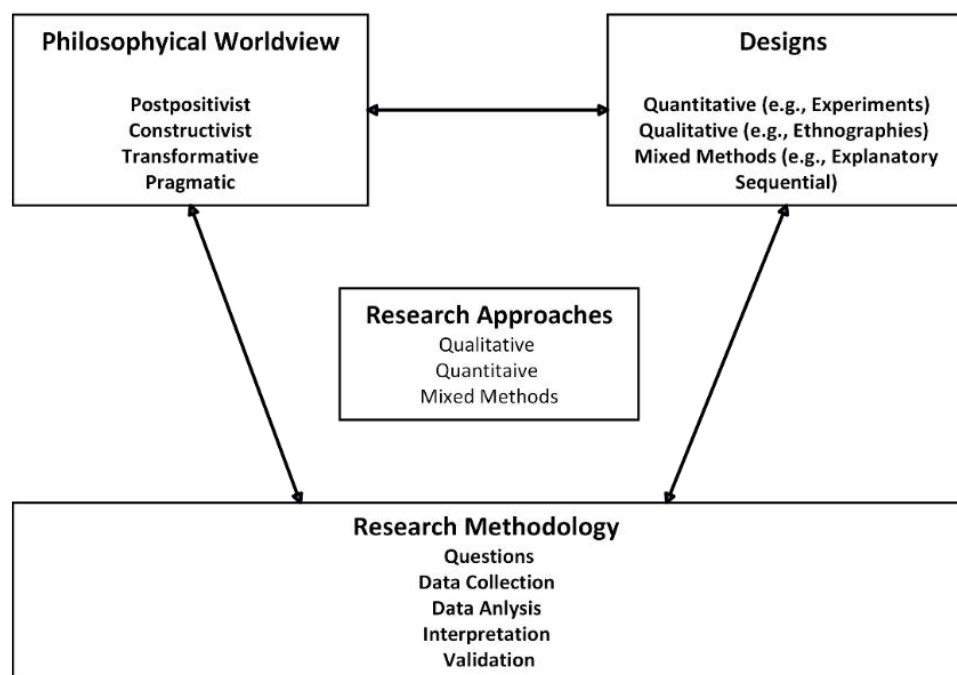


Figure 18. Research Framework (Creswell, 2014)

4.4 Research Philosophy

The researcher's personal views about the world and how it works must be considered when planning a study. These presumptions are referred to as a "set of basic beliefs (or metaphysics) that deals with ultimate or first principles" and have been called paradigms (Guba and Lincoln, 1994) or worldviews (Creswell and Creswell, 2018). It stands for a worldview that describes the nature of the "world," the location of the

individual within it, and the variety of potential interactions with the world and its components for the person holding it.

The literature emphasises ontology, epistemology and methodology as the three main pillars of research philosophy (Guba and Lincoln, 1994). The term *ontology*, from the Greek onto means ‘being,’ and logia, which means ‘science,’ refers to the presumptions made about the nature of reality and the subject of what makes reality what it is (Crotty, 1998). What is the world made of, and what can be learned about it? For instance, if one assumes a “real” world, then one can learn “how things really are” and “how things work” (Guba and Lincoln, 1994: 108). The term *epistemology*, derived from the Greek word for “knowledge,” refers to the nature of the relationship between the knower (or would-be knower) and what can be known. Finally, methodology (as distinct to method) refers to the ways the researcher collected (e.g. surveys) and analysed the data, the type of research chosen and rationale behind the methodology (Yin 2011).

4.4.1 Positivism

Positivism supports the empiricist theory of natural scientists, who say that things that can be seen, touched, or heard can only be known. According to this view, the purpose of theory is to formulate hypotheses and devise experiments for their evaluation. (McGregor and Murnane, 2010). It posits that knowledge can be acquired by the aggregation of facts, which serve as the foundation of the generalisation of rules (Bryman and Bell, 2019). This perspective asserts that items in the world hold meaning regardless of any awareness or perception of them (Lee, 1999). It presupposes that observers are impartial and completely detached from their observations (Crotty, 1998) and that the inquiry is performed as if through a one-way mirror (Guba and Lincoln, 1994). Nonetheless, as others highlight, this viewpoint neglects the ideas, emotions and values of human observers, which are largely disregarded by conventional positivist theories (Bryman and Bell, 2019).

These limitations resulted in the development of a postpositivist perspective, acknowledging that absolute certainty regarding our knowledge assertions in the study of human behaviour is unattainable (Creswell and Creswell, 2018). Similar to positivism, post-positivism posits an objective reality can only be imperfectly

comprehended due to intrinsic limitations in human cognition and the intricate character of the phenomenon (Guba and Lincoln, 1994). Informal description in this context delineates the persistent association of occurrences, correlating inputs to outcomes; nonetheless, these descriptions often lack deeper explanations (Smith, 2006).

This methodological difference is evident in the use of statistical survey methods that ask ‘who’ and ‘what’ questions, which is contrasted with qualitative approaches that explore ‘how’ and ‘why’ questions (Yin, 2011). For instance, in Chapter 5, the qualitative part uses interviews to examine individual intentions, for example, to recycle, including attitude towards recycling behaviours (Yuriev *et al.*, 2020b; Huang *et al.*, 2022). This difference highlights the gap between theory and practice in social science, as the aim is to progress from merely identifying (who and what) events to explaining their causes (how and why). Additionally, there is an inconsistency that arises with the generalisability of the findings. A QUANT approach assumes uniformity of nature and seeks to apply findings across different contexts, leading to assumptions that may extend beyond the evidence (Smith, 2006).

4.4.2 Interpretivism

Interpretivism is frequently paired with constructivism, which challenges the positivist paradigm by asserting that the observer’s main duty is to decipher the meanings underlying individuals’ behaviours. Interpretivist studies emphasise the “Subjective meanings and social-political, as well as symbolic action in the process through which humans construct or reconstruct their reality” (Orlikowski and Baroudi, 1991: 13). Individuals utilise their perceptions of reality to comprehend the universe in which they live (Bryman and Bell, 2019). Individuals’ interpretations are evaluated not in terms of accuracy but in terms of knowledge or sophistication (Guba and Lincoln, 1994). The researcher seeks the intricacy of perspectives rather than a limited interpretation, as individuals may possess numerous meanings.

Scholars acknowledge that interpretivist perspectives are influenced by individual, cultural and historical experiences stemming from their origins (Willis, 2007; Uduma and Sylva, 2015). This perspective leads to an inability to distinguish between dependent and mandatory results, raising issues about general production and

application of knowledge. In the lack of a rational basis for choosing among competing theories, how can generalisation be warranted? Given that reality perpetually influences our perception, it may be asserted that interpretivist researchers operate under a realist framework in practice (Smith, 1996; Smith and Stenning, 2006).

4.4.3 Pragmatism

Pragmatism is not confined to a single system of philosophy or reality. According to this perspective, researchers are free to select the processes, methods, and approaches for their studies that best suit their unique goals and objectives (Creswell and Creswell, 2018). Pragmatism contends that the interpretation of meaning transcends specific methodologies and that the meaning of an event cannot be determined before experiencing it (Denzin and Lincoln, 2018). However, pragmatism should not be seen as a catch-all viewpoint that accepts “wherever works” methodologically. Rather, it should be seen as a fresh perspective on how traditional worldviews differ from one another and treat those distinctions as social contexts for investigation rather than as impersonal philosophical systems (Creswell, 2014).

According to Morgan (2014), knowledge is an active process of inquiry that generates a constant back-and-forth between beliefs and actions rather than an abstract relationship between the knowers and the known. Since pragmatism is neither an ontological nor metaphysical method of investigation, it does not aim to analyse forms of causation in a strict sense (Morgan, 2007). To best address the study issue, researchers who take a pragmatic viewpoint can use a variety of data collection techniques, such as quantitative and qualitative methods (Creswell, 2007). Table 9 shows a comparison between the research paradigms discussed above.

Table 9. Research Paradigms (Adapted from Creswell, 2014)

Paradigm	Ontology	Epistemology	Methodology
Positivism	Single and absolute truth or reality	Objectivist, reality can be attained and measured, and the process can be verified.	A firm methodology based on experimental strategies.
Interpretivism	There are multiple realities, not even one.	In subjectivist epistemology,	Naturalist methodology is

		reality or truth, is socially constructed	based on qualitative approaches.
Pragmatism	Reality is perpetually renegotiated disputed, and interpreted based on its utility in novel and unforeseen circumstances	The optimal approach is the one that effectively resolves issues.	Mixed method, design-based method, action research.

4.5 Research Approach: Sustainability in Small Businesses

Sustainability has been examined by quantitative (positivist) methodologies, qualitative (transformative) methodologies, or a mix of both methodologies (mixed methods) (Neergaard & Ulhøi, 2007). An analysis of techniques in prominent journals indicates a prevailing dependence on a positivist approach (Brush et al., 2009; McDonald et al., 2025; Neergaard & Ulhøi, 2007). McDonald et al., (2015) explicitly examined changes in entrepreneurship across the top five journals over a span of 29 years. Their findings indicate a significant decline in the use of surveys as the primary method for analysing sustainability, dropping from 64% in 1985 to 32% in 2013 (see Table 10). Conversely, interviews, another common qualitative method have seen a gradual increase in usage, rising from 3% in 1985 to 17% in 2013. The case study method has remained relatively stable over this period. The table also highlights a noticeable shift toward qualitative data collection in sustainability research, although its overall impact on the field remains limited (McDonald *et al.*, 2015).

Table 10. Primary Methods Over Time (Source: McDonald et al., 2015)

Research Methods	1985	2013
Survey (QUANT)	64%	32%
Interview (QUAL)	3%	17%
Case study (QUAL)	10%	9%

Researchers suggest that sustainability has historically been approached as a normal science, leading to a preference for quantitative methods consistent with the positivist tradition (Aldrich & Baker, 1997). Brannen (1992) suggests that while positivist approaches are beneficial for generating general and representative descriptions, qualitative methods are more appropriate for delving beyond generic

levels in empirical studies. Scholars suggest that aligning the research methods with research questions, highlights which method is more appropriate for addressing the research questions (Aldrich & Baker, 1997; McDonald et al., 2015).

On reflection, different methods are not innately beneficial or detrimental. Rather, the issue is their level of appropriateness, and this varies depending on context (Wellington and Szczerbinski, 2007). As this study seeks to examine and enable a richer understanding of small business uptake of sustainability practices in SMEs, a sequential mixed method approach is deemed appropriate (see Figure 20). This study adopted a pragmatist deductive-inductive approach, using both surveys, interviews and secondary data (business cases). According to Teddlie and Tashkkori (2009), this approach enables researchers to answer both confirmatory (RQ1) and exploratory (RQ2) questions at one time. While exploratory research is observational and tries to uncover previously unknown features of a problem, confirmatory research tests a priori research hypotheses based on current theory (Jaeger et al., 1998).

4.5.1 Quantitative Approach

A quantitative approach is a deductive research method based on a post-positivist viewpoint, involving the testing of a theory through the analysis of connections between variables via survey instruments. The acquired quantitative data is subsequently analysed employing statistical methods (Creswell, 2014). This approach relies on deductive reasoning, starting with an established theory. This approach supports the development of hypotheses that are accepted or rejected depending on quantitative evidence (Bell, Bryman & Harley, 2018; O'Reilly, 2008). Additionally, quantitative research enables the researcher to generalise and replicate findings to a broader population from which the participants were drawn (Sukamolson, 2007).

Critics argue that although quantitative approaches offer extensive coverage via high sample sizes, they fall short of providing the depth necessary for a comprehensive understanding of the phenomenon being examined (Sukamolson, 2007; Venkatesh, Brown & Bala, 2013). Furthermore, quantitative research initiates with a pre-established theory, largely assessing existing ideas, which may limit its efficacy in generating novel insights or explanations (O'Reilly, 2008). This research seeks to bridge a knowledge gap by initially examining business owners intention to

uptake sustainability practices (RQ1), such as achieving carbon neutrality, implementing energy efficient measures, reducing waste, shifting to green supply chains, socially responsible marketing, and community engagement (Nygaard, Kokholm and Huulgaard, 2022; Smith et al., 2022).

4.5.2 Qualitative Approach

The analysis of qualitative data employs inductive reasoning, wherein the researcher commences without preconceived notions and progressively formulates a workable hypothesis from the facts (Saunders, Lewis and Thornhill, 2009). A qualitative method is grounded in a constructivist perspective, seeking to comprehend the viewpoints and interpretations of a social issue from the standpoint of individuals or groups (Creswell, 2014). This methodology is frequently employed in explanatory research and entails the gathering of qualitative data via techniques such as group discussions, focus groups, or individual interviews to investigate participants' perceptions and convictions (Creswell and Poth, 2016). The examination of qualitative data relies on inductive reasoning, wherein the researcher begins without preconceptions and progressively formulates a theory from the facts (Saunders, Lewis & Thornhill, 2009). Qualitative research offers profound insights into the study problem; nevertheless, its context-specific characteristics hinder the transferability or generalisation of findings to other contexts (Bansal and Corley, 2011; Cornelissen, 2017).

4.5.3 Mix-Methods Approach

A mixed-methods strategy is based on a pragmatic perspective, integrating quantitative and qualitative data inside a singular research investigation (Creswell, 2014; Venkatesh, Brown & Bala, 2013). This method is based on the premise that the integration of multiple data kinds provides a more thorough comprehension of the studied phenomenon than independent examination (Creswell, 2014). Quantitative data, characterised by closed-ended responses, is generally obtained via survey instruments, whereas qualitative data, defined by open-ended responses, is collected through techniques such as interviews or focus groups. The mixed approach recognises that both quantitative and qualitative data collection methods possess intrinsic limitations that can be alleviated by the utilization of both data kinds (Creswell, 2014). The triangulation obtained from this combination offers a more

profound comprehension of the issues being examined (Creswell, 2014). Table 11 delineates a comparison of the three research approaches.

Table 11. Research Approaches Compared (compiled by author)

	Quantitative	Qualitative	Mixed-Methods
Philosophical Assumptions	<ul style="list-style-type: none"> • Post-positivist 	<ul style="list-style-type: none"> • Constructivist 	<ul style="list-style-type: none"> • Pragmatic
Strategies of enquiry	<ul style="list-style-type: none"> • Experiments and surveys 	<ul style="list-style-type: none"> • Phenomenology, grounded theory, narrative, ethnography, case study 	<ul style="list-style-type: none"> • Sequential, parallel and transformative
Methods	<ul style="list-style-type: none"> • Closed-ended questions. • Predetermined approaches • Numeric data 	<ul style="list-style-type: none"> • Open-ended questions • Emerging approaches • Test or image data 	<ul style="list-style-type: none"> • Both open-ended and closed-ended • Both predetermined and emerging approaches.
Research Practices	<ul style="list-style-type: none"> • Test or verify theories. • Relates variables in questions or hypothesis • Employ statistical procedures 	<ul style="list-style-type: none"> • Focus on meanings, • Study context and participant settings. • Create an agenda for change and reform 	<ul style="list-style-type: none"> • Collects both QUANT and QUAL data. • Develop a rationale for mixing • Practices of both QUANT and QUAL research and employed
Data forms	<ul style="list-style-type: none"> • Numeric 	<ul style="list-style-type: none"> • Narrative 	<ul style="list-style-type: none"> • Numeric and narrative
Data Analysis	<ul style="list-style-type: none"> • Statistical analysis • Descriptive and inferential 	<ul style="list-style-type: none"> • Thematic strategies • Categorical and contextualising 	<ul style="list-style-type: none"> • Integration of thematic and statistical.

4.6 Rationale for Mixed-Method Design

This study formulated two research questions and five corresponding research objectives. These were detailed in Chapter 1, Section 1.6.1. The rationale for a mixed-methods design aligns with Patton's (1990) "Paradigm of Choices," which advocates for selecting methods based on their appropriateness for addressing specific research

questions. Simply, different methods are suitable for answering different types of research questions (Molina-Azorin, 2016).

Adopting a Mixed-Method Research (MMR) approach offers the possibility of combining two sets of strengths, while compensating at the same time for the weakness of each method. Simply, one method is suitable to answer one type of question, and another method is suitable for another type of question (Kallemeyn, Hall & Gates, 2020). The intention to adopt sustainability practices (RQ1) was best addressed with quantitative approach, while identifying interdependencies (RQ2) required a qualitative approach to dissect complex relationships between diverse social actors (Helbig, Gil-Garcia & ferro, 2009). The rationale for this methodological choice emerged from reflective practice during the research design process (see Fig 20). The merits and popularity of a MMR among researchers was clear in literature, though was somewhat daunting to me as an early career researcher.

Finally, in reviewing my journal documenting regular supervisory meetings, a key realisation was my need to shift from describing things to thinking more critically (and writing with greater brevity) and using evidence strategically to support my ideas. Another important realisation was learning to question the literature more carefully. I tended to assume that the most recent sources were always the best. I came to understand that what mattered more was the rigour and relevance of the literature to the research question. This developing awareness, supported by an experienced supervisor, helped shape my choice to adopt a mixed-methods research approach.

4.7 Research Design

Research design denotes a systematic framework for executing a research initiative. It functions as a conceptual framework for tackling particular inquiries. It delineates the research context and specifies methodologies for data gathering and analysis, directing the research from initiation to conclusion (Lavrakas, 2008; Creswell, 2014). This study employs a pragmatic perspective and utilizes a mixed-methods approach, integrating both quantitative and qualitative data to address the research issues. Every design methodology possesses inherent shortcomings and biases; thus, the integration of quantitative and qualitative data serves to alleviate the constraints of each method

(Creswell, 2014). There are two mixed-method designs: parallel mixed methods and sequential mixed methods (Teddle & Tashakkori, 2009).

4.7.1 Sequential Mixed Methods

Sequential mixed methods in research require a systematic collection and analysis of data in distinct stages, wherein one type of data collection succeeds the other. Typically, this approach commences with either quantitative or qualitative data collection, with the outcomes of the initial phase informing the subsequent phase (Ivanka, Creswell & Stick, 2006). For instance, a study may utilise the findings to develop a quantitative survey for a broader sample. This methodology enables researchers to build upon the insights from an earlier phase, so offering a comprehensive understanding of the research problem (Stick and Ivankova 2004; Creswell, 2014).

4.7.2 Parallel Mixed Methods

Parallel mixed methods in research involve the simultaneous collection and analysis of both quantitative and qualitative data. This approach allows for the concurrent collection of different types of data, which are analysed independently yet concurrently (Demir and Pismek, 2018). The integration of findings occurs during the interpretation phase, where insights from both data sets are combined to provide a comprehensive understanding of the research problem.

In a parallel mixed-methods design, researchers can address research questions that require diverse types of information. For instance, quantitative data may provide broad, generalisable findings about the prevalence or patterns of a phenomenon, while qualitative data can offer in-depth insights into participants' experiences and perspectives. By collecting these data simultaneously, researchers can ensure that both types of data are reflective of the same time period and context, which enhances the coherence and validity of the study (Leech and Onwuegbuzie, 2009). This design is particularly advantageous as it allows for the triangulation of data, where the strengths of one type of data can compensate for the weaknesses of the other. For example, quantitative data can provide statistical power and generalizability, whereas qualitative data can offer contextual richness and depth. When integrated, these data sets can

provide a more holistic understanding of the research problem than either could alone (McKim et al., 2017; Shan, 2022)

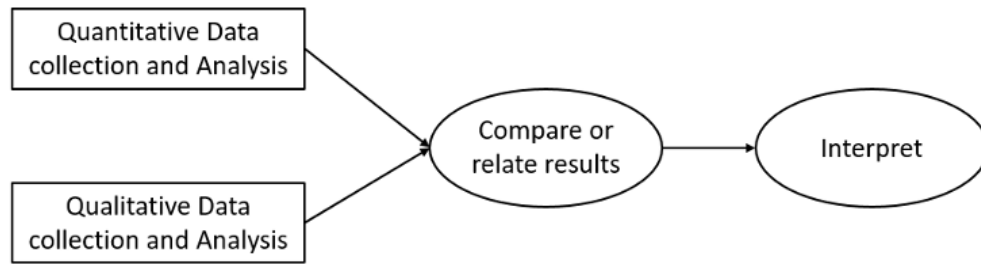


Figure 19. Mixed Methods Design (Creswell, 2014)

4.7.3 Mixed Methods Design Criteria

Multiple elements must be taken into account while designing a mixed methods study. The next inquiry to consider is whether the study will utilise a singular method (either quantitative or qualitative) or a combination of both. If both methodologies are employed, the study is classified as a mixed methods design. The essential factor is ascertaining the quantity of strands or study stages. Each strand or phase consists of three separate stages: the conceptual stage, the experiential stage, and the inferential stage (Teddlie & Tashakkori, 2009). A crucial factor to consider is whether the gathering of quantitative and qualitative data will take place sequentially or concurrently. Table 12 delineates the design aspects that guided this study.

The conceptualisation phase entails the formulation of the study problem and associated questions. The experiential stage involves data gathering and processing, whereas the inferential stage emphasises offering explanations and deriving inferences from the gathered facts (Teddlie & Tashakkori, 2009). A conventional qualitative or quantitative study is classified as a mono-strand study, while sequential or parallel mixed methods designs are categorised as multi-strand studies (Teddlie & Tashakkori, 2009). During the conceptual phase of this study, distinct yet interconnected research questions are formulated for both the quantitative and qualitative components. Quantitative data is collected through an online survey, whereas qualitative data is acquired through semi-structured interviews. Quantitative data is analysed using SPSS and Structural Equation Modelling (SEM), while qualitative data undergoes thematic analysis.

The next aspect of design pertains to the collection of both QUAL and QUAN data across multiple levels of analysis. Multilevel mixing occurs under this circumstance (Teddlie & Tashakkori 2009). This study used a multilevel mixing technique, collecting QUAN data at the citizen level and QUAL data at the practitioner level. The results are subsequently incorporated into the framework for the adoption of sustainability practices by small enterprises. This approach involves the collecting of both quantitative and qualitative data at many levels and requires the integration of data across these analytical levels. Research on the integration of multilevel mixed approaches is significantly limited (Headley & Plano Clark, 2020; Schoonenboom & Johnson, 2017). The methodological approach developed for this study seeks to somewhat rectify this methodological gap.

Table 12. Mixed Methods Design Criteria

Criteria	Design Questions	Possible Values	Remarks
Number of methodological approaches	Will this study involve one or both methods (Quantitative and Qualitative)?	Mono-methods study. Mixed-methods study	The study involves using two methods (both QUANT and QUAL). Therefore, it is a mixed methods design.
Number of strands per phases	Will the study involve one phase or multiple phases?	Mono-strand Multi-strand	Multi-strand (separate conceptualisation, experiential and inferential stage for both QUANT and QUAL phases).
Types of implementation process	Will the QUANT and QUAL data collection occur in parallel or a sequential manner?	Parallel Sequential Conversion Multilevel Combination	Data collection will occur in a parallel manner. Therefore, it is a parallel mixed-methods design.

This study uses both confirmatory (QUANT) and exploratory (QUAL) approaches. The confirmatory approach, a survey tested 11 hypotheses, with SEM then used to extract higher-order constructs to improve the predictive model. Additionally, the exploratory approach based on interviews and secondary data, aimed to identify the interdependencies among factors that either facilitate or hinder the uptake of sustainability practices. These outcomes can be viewed as the effects or consequences

of corporate actions on the environment, society, and financial practices. Furthermore, interdependence theory can help highlight disparities between material and personal outcomes that engender behavioural transformations (Kelley et al., 2003a; Raveendran, Silvestri and Gulati, 2020). Figure 20 depicts the design and implementation phases of the parallel mixed-methods approach utilised in this study (Teddle & Tashakkori 2009).

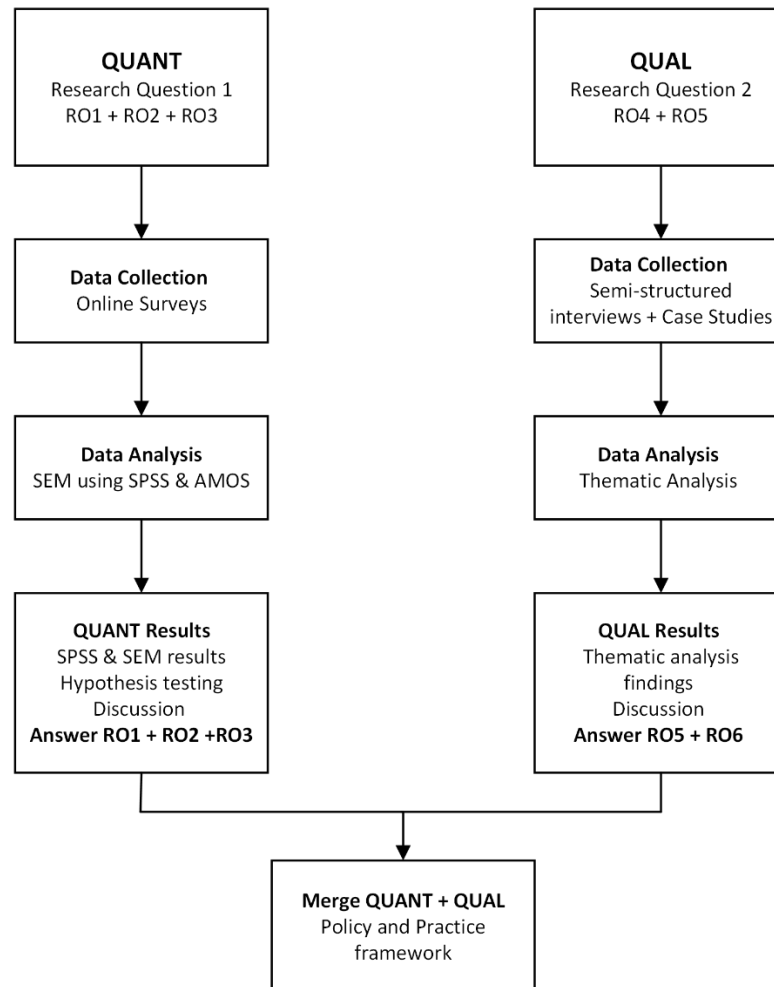


Figure 20. Mixed Methods Research Design

The research implementation process was divided into four main stages. Initially, the research questions and objectives were formulated. The second stage involved data collection. For the Quantitative aspect, a survey instrument was designed, and data was gathered through online self-administrated questionnaires. For the qualitative part, semi-structured interviews and case studies were collected. The interviews were conducted online via MS Teams. The third phase focused on analysing the collected

data using both quantitative and qualitative methods. The quantitative data was first evaluated using SPSS, followed by detailed analysis and hypothesis testing with AMOS. The qualitative data was analysed using NVivo. The quantitative phase addressed research question 1 and research objectives; RO1, RO2 and RO3, while the qualitative phase addressed research question 2 and research objectives; RO5 and RO6 respectively. In the final stage, the findings from both quantitative and qualitative analyses were synthesized to grounded models.

4.7.4 Sampling Strategy

A sampling strategy refers to the plan and methodology employed to select a subset of individuals or cases from a larger population to conduct research. This strategy is crucial in ensuring that the sample accurately represents the population, thereby allowing for the generalization of findings. According to Salkind (2010), sampling involves drawing a small segment from the population to gather data and infer results applicable to the whole group. Sampling strategies can be categorized into probability and non-probability sampling. In probability sampling, every member of the population has an equal chance of being included, enhancing the representativeness and reliability of the findings (Saunders, Lewis, & Thornhill, 2009). Conversely, non-probability sampling does not provide equal selection chances, which can lead to biases but may be practical under certain research constraints (Saunders, Lewis & Thornhill, 2009). The choice of sampling strategy is dictated by the study's objectives, available resources, and the need for generalizability (see Table 13).

Table 13. Sampling Approaches

Sampling	Probability/random	Non-probability/non-random
Meaning	Each sample possesses an identical likelihood of selection	The specific sample from the population to be selected is indeterminate
Methods	Simple random sampling stratified random sampling, systematic random sampling, cluster sampling, and multi-stage systematic	Convenience sampling is purposive, sampling quota sampling, and snowball sampling. These methods are subjective in nature

	sampling. These methods are objective in nature.	
Main features	Efficiency in cost and time. Utilised for hypothesis testing. It possesses significant external validity and generalisability	Protracted. Can be utilised to examine current theoretical discoveries or develop new ones. It lacks generalisability.

Considering the distinct characteristics of each sampling method and the research objectives, simple random sampling was selected for the quantitative phase, while snowball sampling was chosen for the qualitative phase. The literature indicates that simple random sampling (Ahmad, 2012; Benzing et al., 2009; Walker & Brown, 2004) and snowball sampling (Ahmad, 2011; Holland, 2014) are extensively utilised. Researchers affirm that employing mixed-method sampling strategies is common in data collection (Teddlie & Tashakkori, 2009).

4.7.5 Sample Size

After selecting the sampling technique, the next stage in the research process is to ascertain an adequate sample size. In studies where non-probability sampling techniques are used, the issue of determining sample size is ambiguous (Saunders, Lewis & Thornhill 2009). Rather, it is argued that sample size depends on the RQs and ROs, what the researcher needs to find out, what will have credibility and what is practical given the resources and time available to conduct the research (Saunders, Lewis & Thornhill 2009). A crucial factor in ascertaining the sample size is the nature of the required data analysis (Hair Jr et al. 2014).

This study employs Structured Equation Modelling (SEM) for quantitative data analysis, using SPSS AMOS. Determining a definitive minimum sample size for SEM is challenging; nonetheless, a sample size of 200 is considered the minimum (Kline, RB 2015). This study has a sample size of 516. A sample of at least 200 is generally considered the minimum for reliable results (Kline, 2015). In this study, a sample size of 516 was used, providing a robust basis for conducting SEM and increasing the reliability and generalisability of the findings.

4.7.6 Survey Instrument Development

It is important that the survey instrument adequately measures the concept of interest or what is described as having *content validity*²—one of several measures of how well the instrument covers the constructs it means to measure (Boateng et al. 2018). In research scenarios where existing scales can be used, it is often recommended to use or adapt existing scales (Saunders, Lewis & Thornhill 2009). Following this advice existing validated instruments are used, however, are adapted to the context to address the research objectives of the study. Table 14 lists the number of variables, and the scale used to measure them.

Table 14. Constructs and Scales

Construct	Items	Source
Awareness	7 items	Soydan and Samur, (2017)
Commitment	3 items	Davis, Green, and Reed, (2009)
Knowledge	5 items	Mostafa, (2007)
Attitude	4 items	Thoradeniya et al., (2015)
Leadership	5 items	Blok et al., (2015)
Sustainability Culture	6 items	Mani and Gunasekaran, (2018)
Social Pressure	4 items	Gualandris and Kalchschmidt, (2014)
Regulation Compliance	2 items	Ehrgott (2011)
Government Regulation	9 items	Sancha, Longoni, and Giménez, (2015)
Subjected Norm	4 items	Thoradeniya et al., (2015)
Perceived Behaviour Control	4 items	Thoradeniya et al., (2015)
Access to Infrastructure	9 items	Thoradeniya et al., (2015)
Access to Resources	6 items	Thoradeniya et al., (2015)
Access to Funding	5 items	Thoradeniya et al., (2015)

² There are four types of validity: content validity, criterion-related validity, construct validity, and face validity. See: <https://www.sciencedirect.com/topics/nursing-and-health-professions/content-validity>

4.7.7 Pilot Testing

Pilot testing occurs before the initiation of the primary data collection phase. The initial analysis of pilot data verifies that the gathered information addresses the research questions. A pilot study can enhance the survey instrument and suggest the probable reliability and validity of the result (Saunders, Lewis and Thornhill, 2009). Before pilot testing, it is essential to ascertain content validity by expert evaluation of the measurement instrument's appropriateness and representativeness (Wellington and Szczerbinski, 2007; Lê and Schmid, 2022). Feedback was collected from three subject matter experts. Notably, the survey instrument was based on an existing instrument and only minor changes were required. The survey instrument was derived from a pre-existing tool, necessitating relatively few modifications. A pilot study was performed including a cohort of 12 participants with small company experience. The participants were requested to provide comments on several elements of the questionnaire, including the duration required for completion, unclear questions, omitted topics, and formatting concerns (Creswell and Poth, 2016). In response to participant input, the questionnaire was amended to enhance clarity and organization.

4.8 QUAL Implementation

RQ2, the exploratory aspect of this study, was conducted utilising interview data, alongside thirty business case studies and information gathered from replies to open-ended survey questions. A total of 5 interviews were completed out of 9 planned interviews, plus a focus group that helped confirm survey questions. Locating willing participants was difficult. Qualitative data was supplemented by survey based open-ended question and 30 business reports. Responses (themes) were largely similar, and given the survey question open-ended responses, it was deemed no further benefits would be gained. In effect saturation was deemed evident. Saturation is a widely accepted criterion in qualitative research to ensure depth and richness of understanding (Creswell, 2013). The detailed list of the business reports is provided in Appendix 8.

Interviews can be categorised into structured, semi-structured, and unstructured. In a structured interview, respondents are posed exclusively with planned identical questions. Structured interviews are occasionally referred to as interviewer-administered questionnaires. Conversely, semi-structured interviews are

directed by essential themes, allowing the interviewer the latitude to explore significant emerging ideas in greater depth (Saunders, Lewis & Thornhill 2009). In unstructured interviews, there are no predetermined questions. The interview is casual and examines the subject matter comprehensively. This study employed a semi-structured approach guiding the interview while allowing for the emergence of ideas throughout the discussion (Creswell and Poth, 2016; Gill, 2021).

4.8.1 Designing the Interview Schedule

The design of the interview schedule was structured to allow adequate time between each session, typically ranging from 3-5 days, in alignment with participant availability while ensuring sufficient time for transcription and thematic reflection. Each interview lasted approximately 50 minutes, followed by one hour for the researcher to reflect on key themes and identify recurring patterns. This frame facilitated the adaption of subsequent interview questions, allowing subsequent interview questions, along with emerging concerns raised by participants to be incorporated, thus enhancing the depth of the data collection process. The priority was to capture the participants' voices authentically, ensuring their experiences and perspectives. This approach is consistent with grounded theory methods, which emphasise iterative analysis and adaption during data collection qualitative (Corbin and Strauss, 1990; Creswell, 2014).

4.8.2 Participant Selection

An important criterion for participant selection is, as literature suggests, their ability to provide key information and valuable insights into the issues under investigation (Reybold, Lammert & Stribling 2013). This is referred to as purposive sampling, wherein participants are intentionally chosen for their capacity to furnish comprehensive and profound information pertinent to the research aims (Teddlie & Tashakkori 2009). Given this consideration, participants were identified at various levels within small to medium-sized businesses, as well as consultants specialising in sustainability practices. These participants were essential for their roles in implementing and advising on sustainability practices. Business owners and managers provide insights into the operational and strategic aspects of sustainability in their

companies, while Consultants offer perspectives on the challenges and best practices observed across different businesses.

This approach ensured access to a diverse range of insights concerning sustainability practices in small to medium-sized enterprises. In total of 5 interviews were completed out of 9 planned interviews. Locating willing participants was difficult. This number was deemed sufficient as meta-themes can be extracted in as few as six interviews (Guest, Bunce & Johnson 2006). Furthermore, Qualitative data was supplemented by survey based on open-ended questions and 30 business reports. The reports were drawn from a range of sources - the CSO, Enterprise Ireland, PWC and AIB, with a focus on 'specific to Ireland' material (see Appendix 8). Responses (themes) were largely similar, and given the survey question open-ended responses, it was deemed no further benefits (insights) would be gained. In effect saturation was deemed evident.

4.8.3 Conduct of Interviews

Interviews were conducted online via MS Teams depending on the participants' preferences, spanning from March 2023 to August 2023. Before each interview, informed consent was diligently obtained in adherence to ethical guidelines. Interviews were conducted in English. Following the interviews, transcripts were translated and prepared for the thematic analysis outlined in Chapter 6.

4.9 Data Analysis

4.9.1 Quantitative Analysis

Quantitative data analysis is through a two-stage process. Initially, the Statistical Package for Social Sciences or SPSS (version 29) was utilised for preliminary data examination. This involves data preparation, encompassing tasks such as data coding, screening for incompleteness or missing values, and identifying outliers (Stevens, 1984). Descriptive statistics are computed, and the reliability and validity of the data are confirmed before proceeding to the structural model analysis of Partial Least Squares Structural Equation Modelling (PLS-SEM) using AMOS.

SEM is a multivariate analysis technique that is a popular methodology in the quantitative social sciences. Its popularity can be attributed to the sophistication of the underlying statistical theory, the potential for addressing important substantive questions, and the availability and simplicity of software. SEM allows a researcher to examine the relationships between multiple independent and dependent variables (Hair *et al.*, 2017; Mueller and Hancock, 2018), SEM consists of two models: one is a measurement model, and the other is a structural model. The measurement model links observable indicator variables with latent constructs, whereas in a structural model latent constructs are linked with each other (Bacon and Bacon, 2001). SEM analysis is essentially a two-stage process:

- first, assessment of reliability and validity of the measurement model; and
- second, estimating and evaluating the structural relationships.

4.9.2 Qualitative Analysis

This study used semi-structured interviews with small business owners responsible for shaping and implementing sustainability initiatives in Ireland, as well as data sourced from responses to open-ended questions in the survey and business cases. Literature explains that qualitative research inherently involves deciphering meanings from individuals' observations and narratives (Fisher, Neubert and Burnell, 2021). A common structured approach to data analysis is the six-step process by Braun and Clarke (2006): data familiarisation, coding, theme generation, theme review, theme definition and naming, and write-up. Braun and Clarke's approach is flexible and can be applied across a range of theoretical frameworks, making it a versatile method for qualitative research. Braun and Clarke's six-step process is as follows:

- Step 1: Data familiarisation—by reading and re-reading transcripts and notes.
- Step 2: Generating initial codes using NVivo—after familiarisation, an initial codebook is prepared based on key segments of the text and labelling them based on their content. These codes represent meaningful features of the data relevant to research questions and are more specific than broader themes. NVivo is a widely recognised and used software in qualitative research (Leech and Onwuegbuzie, 2011). The software helps streamline

analysis by enabling data sorting (into parent and child nodes) and subsequent theme extraction.

- Step 3: Searching for themes—in this stage, the codes are grouped into broader themes or patterns capturing significant ideas or trends across the data set. The focus here is on collating related codes and beginning to form coherent and potentially relevant themes.
- Step 4: Reviewing themes—this involves refining and checking relevance and coherence both within individual themes and across the entire dataset. Here some themes might be combined, split, or discarded if they do not have enough supporting data.
- Step 5: Defining and naming themes—each theme is clearly defined and named. At this stage, sub-themes can also be identified if relevant.
- Step 6: Producing the Report—writing up the analysis in a coherent narrative that explains how the themes answer the research questions.

Once the initial codes were identified (Step 2 in Braun and Clarke's 6-step approach), the analysis transitioned to applying the Gioia methodology (GM), a 3-step systematic approach for concept development (Van Maanen, 1979; Gioia, Corley and Hamilton, 2013a). The reason for incorporating the Gioia methodology is that it is a structured qualitative approach. Magnani and Gioia (2023) suggest that it can meet the standards of rigour associated with trustworthy research. Also, GM has been used successfully in international business and entrepreneurship research and is underpinned by several major assumptions that align well with the RO2 of this study, which seeks to explore the structure of situations (interdependencies) that can influence behaviour and lead to (un)sustainable practices. Examples include waiting to see how others behave and using cooperation, competition or individualism to maximise one's outcomes (Van Lange *et al.*, 1997; Van Lange and Balliet, 2015). One assumption is that organisational phenomena are socially mostly constructed (Berger and Luckmann, 1966). Another is these phenomena are structural in character (Giddens 1984). That is the actions taken by organisational members create structures that recursively enable and constrain future actions. A further key assumption is that people are knowledgeable, they know what they do, why they do it and how they do it (Magnani and Gioia, 2023).

Using the GM, the initial data structure is arranged as 1st-order concepts that capture the participants' language and perspectives. These concepts were then elevated to 2nd-order themes through analytical abstraction, allowing for the development of theoretical insights. The final stage involved synthesizing these themes into aggregate dimensions, providing a structured conceptual model which is explained in Chapter 6. By combining the flexibility of Braun and Clarke's approach with the systematic rigour of the Gioia method, the qualitative analysis can help capture both rich thematic insights and develop a coherent explanatory framework.

4.9.3 Common Method Bias

A mixed method approach allows for the triangulation of data, where the strengths of one type of data can compensate for the weaknesses of the other. For example, quantitative data can provide statistical power and generalizability, whereas qualitative data can offer contextual richness and depth. When integrated, these data sets can provide a more holistic understanding of the research problem than either could alone (McKim et al., 2017; Shan, 2022).

For the quantitative part of the study, in Chapter 5 (RQ1), reliability and validity tests were conducted prior to structural equation modelling. Cronbach's alpha and composite reliability confirmed internal consistency, while AVE and Fornell-Larcker criteria supported convergent and discriminant validity. Skewness and kurtosis values indicated acceptable normality, validating the dataset for SEM analysis.

Turning to qualitative part of the study (RQ2), several measures were implemented to minimise common method bias. First, diverse data collection methods—including interviews, open-ended survey questions, and business reports—helped reduce reliance on a single source (SME owners). Second, triangulation using multiple data sources, as shown in Table 30 (in Chapter 6), consolidated key themes and helped reduce both confirmation and cultural bias. Further the use of Gioia methodology, helped enhance analytical rigour and led to the development of two grounded models. Finally, researcher reflexivity was supported through ongoing engagement with SME owners and participation in various Maynooth University forums, including a business poster presentation, doctoral seminar group (MN805),

and discussions with Business Analytics Master's students working with the SME quantitative data.4.10 Ethics

Ensuring adherence to ethical principles stands as a cornerstone in any research endeavour. This investigation adhered to both the ethical standards outlined by Maynooth University and those personally upheld. Before commencing data collection, ethical clearance was secured from the Maynooth University Human Research Ethics Committee – see Appendix 6. Participants were furnished with an informational document delineating the study's objectives and potential risks and seeking consent – see Appendix 7. Consent, obtained from participants, underscored the voluntary nature of their involvement and their prerogative to withdraw at any juncture. Furthermore, participants were assured of the confidentiality and anonymity of their data. Notably, no individuals were identified by name during interviews.

4.10 Chapter Four Summary

This study aims to develop *a better understanding of the awareness of sustainability and associated practices by SME owners and to extend this understanding towards activating the collective potential of small businesses as environmental agents* that research suggests could be powerful (Smith et al., 2022). This chapter outlined the research methodology and approach adopted to examine the two designated RQs that support the study aim. RQ 1 was a quantitative study addressed by a survey of business owners' attitudes and intentions using PBT. RQ 2 was examined in an exploratory study of behaviour by SME owners based on a qualitative analysis of interviews, open-ended questions and secondary data based on business reports.

A sequential mixed method approach (see Figure 20) we deemed appropriate, with the study adopting a pragmatist deductive-inductive approach when examining the respective quantitative and qualitative data. According to Teddlie and Tashkkori (2009), this arrangement is useful when seeking to first answer the study's confirmatory (RQ1) and then exploratory research (RQ2) at one time. We turn now to Chapter 5, which outlines the findings and related discussion to the confirmatory research (RQ1) question.

Chapter 5: Quantitative Findings and Discussion

5.1 Introduction

The preceding chapter detailed the methodology employed in this study. In this chapter, we review the study findings and discussions stemming from the QUANT phase of the study. The chapter addresses RQ 1: *What factors influence the implementation of sustainability practices in SMEs?* This RQ examines the determinants that shape the adoption of sustainability practices by SMEs in Ireland or more simply ‘intention’ by SMEs. Three subordinate research objectives have been formulated as follows:

RO 1: What are the actor-specific characteristics that influence the implementation of sustainability practices in SMEs?

RO 2: What are the organisational characteristics that influence the implementation of sustainability practices in SMEs?

RO 3: What are the resource-based characteristics that influence the implementation of sustainability practices in SMEs?

Hypothesized relationships established in Chapter 3 for each research objective were examined. Initial analysis of the quantitative data was conducted using SPSS for data examination and descriptive statistics as well as reliability and validity tests. Next, structural equation modelling (SEM-AMOS) was used to assess the hypothesized relationships between different variables. This chapter begins by outlining the procedures involved in data cleaning and presenting the initial findings from data examination. Following this, demographic characteristics of the participants are provided along with discussions on correlations and descriptive statistics. The rationale for employing AMOS-based SEM in quantitative analysis is then explained. Subsequently, both the measurement and structural models of SEM analysis are examined, and the outcomes of hypothesis testing are presented. The chapter then concludes with a discussion of the QUANT results, focusing on the impact of various factors that influence the implementation of sustainability practices in SMEs.

5.2 Overview of the Survey Data

5.2.1 Data Collection Process and Sample Size

For data collection, the research utilised a self-administered online questionnaire. The survey instrument was designed and disseminated through Qualtrics; an online platform and the survey was accessible from September 2023 to January 2024. A total of 687 responses were collected. Of this number, 126 responses were deemed incomplete and so excluded from subsequent data analysis. Additionally, 45 responses were identified as outliers or displaying questionable response patterns, leading to their exclusion. Ultimately, 516 responses were retained for analysis. A discussion of the data screening process is provided in section 5.3.1.

5.2.2 Demographic Profile

The demographic profile of the survey is presented in Table 15. Descriptive statistics indicate that 60.5 per cent of the participants identified as male, while nearly 37.4 per cent identified as female while remaining 2.1 per cent opted not to disclose gender.

Table 15. Study Demographics

Demographics	Frequency (N=516)	Percentage
Gender		
Male	312	60.5%
Female	193	37.4%
Prefer not to say	11	2.1%
Age		
18-25	70	13.6%
26-35	116	22.5%
36-45	116	22.5%
46-55	120	23.3%
56 and older	94	18.2%
Education		
Higher Diploma or Equivalent	215	41.7
Bachelors	226	43.8
Masters	70	13.6

Age distribution was categorised into five groups: 18-25 years (13.6%), 26-35 years (22.5%), 36-45 years (22.5%), 46-55 years (23.3%) and 56 years and older (18.2%). Education levels varied among respondents, with 215 (41.7%) holding a Higher

Diploma or equivalent qualification, 226 (41.7%) possessing a bachelor’s degree, and 70 (13.6%) attaining a master’s degree.

5.2.3 Family Business

Family businesses play a pivotal role in Ireland’s economy, contributing to job creation, wealth generation, and overall economic growth. They are recognized for their long-term orientation, commitment to local communities, and ability to adapt to changing market conditions (Breton-Miller and Miller, 2016; Welsh *et al.*, 2018; Georgiou *et al.*, 2023). As noted by Clinton *et al.* (2024), family businesses are integral to the Irish economy, comprising a substantial portion of the country’s Gross Domestic Product (GDP) and serving as the backbone of various industries. Table 16 shows the profile of family businesses relative to other SMEs in the data set.

Table 16. Family Business Demographics

Demographics	Frequency (N=516)	Percent
Family Businesses	211	40.9%
Other	305	59.1%
Generation		
Founder	125	24.2%
Successor	29	5.6%
Second Generation	30	5.8%
Later Generation	15	2.9%

In the examined sample of 516 SMEs, 211 (40.9%) were identified as family businesses, while the remaining 305 SMEs (59.1%) were categorised as other. This proportion underscores the substantial presence of family-run enterprises in the context of this study. Further segmentation in the family business category is provided based on generational status: 125 SMEs (24.2%) were classified as “Founder” businesses, indicating those initiated by their founding members; 29 SMEs (5.6%) were identified as “Successor” businesses, denoting those taken over by the next generation within the family. A subset of family businesses, comprising 30 SMEs (5.8%) were categorized as “Second Generation,” representing those in the hands of the second generation of family members. Lastly, 15 SMEs (2.9%) were classified as “Later Generation”, denoting those managed by generations beyond the second.

5.3.4 Industry Type

Table 17 presents the distribution of businesses across various industry sectors. The sector with the highest frequency is "Retail," encompassing 111 entities, which accounts for 21.5% of the total sample. This indicates a substantial presence of businesses operating within the retail sector in the sample population.

Table 17. Industry Demographics

Industry Type	Frequency (N=516)	Per cent
Accounting Services	7	1.4
Communications	6	1.2
Construction	28	5.4
Education	15	2.9
Electronics, Information Technology, Internet, Telecommunications	13	2.5
Engineering Services	10	1.9
Financial (Banking, Investments)	7	1.4
Health Care	30	5.8
Insurance	3	0.6
Legal Services	10	1.9
Manufacturing	22	4.3
Natural Resources (Agriculture, Forestry, Fishing, Mining and Extraction)	15	2.9
Nonprofit Organisation	8	1.6
Pharmaceuticals	13	2.5
Real Estate	11	2.1
Retail	111	21.5
Transportation	9	1.7
Travel Accommodations and Food Service	43	10.7
Utilities	8	1.6
Wholesale	8	1.6
Hospitality	56	10.9
Services	33	6.4
Beauty	23	4.5
Fitness and Health	15	2.9

Following closely behind are sectors such as "Hospitality" and "Travel Accommodations and Food Service," with frequencies of 56 and 55 entities, respectively. Collectively, these sectors represent approximately 21.6% of the sample, underscoring the significance of businesses engaged in hospitality-related services. Conversely, sectors like "Insurance" and "Utilities" exhibit lower frequencies, with

only 3 and 8 entities, respectively. These sectors represent smaller proportions of the sample, each comprising approximately 0.6% and 1.6% of the total entities, respectively. Other notable sectors include "Construction" (28 entities, 5.4%), "Health Care" (30 entities, 5.8%), and "Services" (33 entities, 6.4%). Each of these sectors contributes to the diversity of industries represented within the sample population.

5.3.5 Necessity and Opportunity Entrepreneurship

Two categories of entrepreneurial business were noted in the literature. Opportunity driven business view sustainability as a value-creation opportunity, by enhancing innovation and competitive differentiation, while necessity-driven entrepreneurs are more concerned with cost and financial incentives (Hilson, Hilson and Maconachie, 2018; O'Donnell, O'Gorman and Clinton, 2021). Questions related to the two distinct types of entrepreneurial businesses were not included in the survey as this literature was realised belatedly. Figure 21 is an attempt to quantify the two categories of based on specific responses to cost related questions in the survey. Simply, the categorisation provides a clear context for support rather than to suggest an undifferentiated, one-size-fits-all, approach for SMEs.

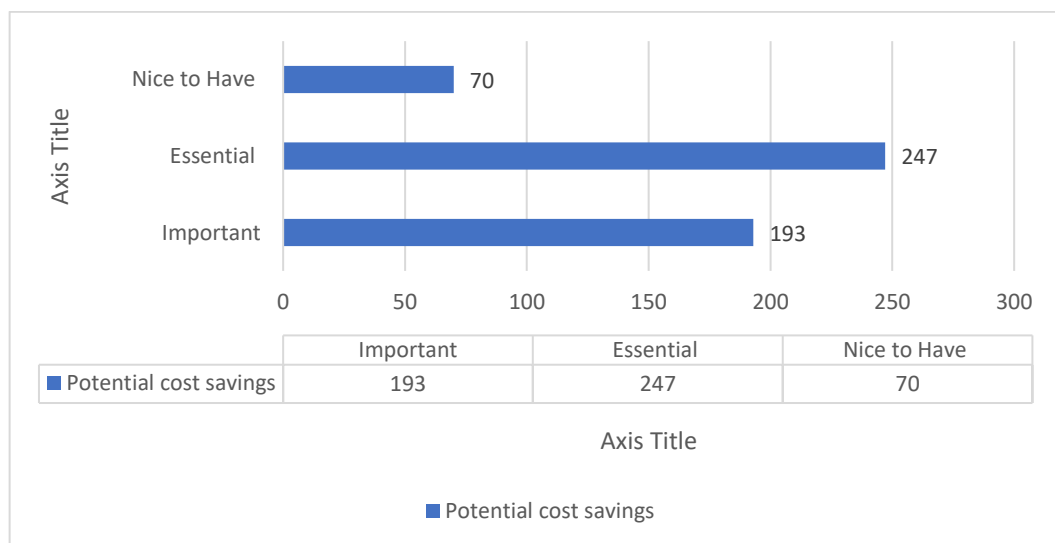


Figure 21. Necessity Entrepreneurs

5.3 Screening of the Data

5.3.1 Missing Data, Straight Lining and Outliers

The survey employed an online format using Qualtrics. A total of 687 responses were collected for the study. Initial screening determined that 148 responses were incomplete and thus unsuitable for inclusion in the analysis. During the data screening, the survey responses were scrutinised for any anomalous patterns known as straight-lining (Chen, Martin and Montague, 2009). This phenomenon occurs when a respondent consistently selects the same choice for multiple questions, indicating unreliability or suspicious behaviour (Motulsky and Brown, 2006). A total of 17 responses were excluded on this basis. Furthermore, the dataset was screened for outliers. Outliers refer to a data point in a dataset that exhibits exceptionally extreme responses compared to most responses (Boukerche, Zheng and Alfandi, 2020).

A univariate outlier demonstrates an extreme response to a single variable, whereas a multivariate outlier showcases an extreme response across multiple variables simultaneously (Boukerche, Zheng and Alfandi, 2020). Detection of univariate outliers can be performed using various methods such as standardized z-scores or visual examination of histograms, boxplots, and normal probability plots in statistical software like SPSS (Hair *et al.*, 2017). A univariate analysis using z-scores was used to identify outliers. Observations with a z-score greater than 3 are often considered as outliers. A total of 26 responses were flagged as outliers for displaying questionable response patterns, thereby further excluding them from the analysis. A total of 516 responses remained for further analysis.

5.3.2 Data Distribution and Normality

This study uses the statistical software IBM SPSS AMOS for Structural Equation Modelling (SEM). AMOS is “non-parametric” and does not require data to be normally distributed (Bacon and Bacon, 2001). However, it is still important to examine data distribution as extremely non-normal data can inflate standard errors, which can be problematic (Raban and Rabin, 2007). Normality refers to a systematic distribution of data points which when plotted on a graph is illustrated by a bell-shaped

curve. The normality of the data can be accessed by examining the skewness and kurtosis of the dataset (Bera *et al.*, 2016).

Skewness refers to the symmetry of the distribution, while kurtosis illustrates how a flat or peaked distribution is compared to a normal distribution (Creswell, 2014). A skewness value greater than 3 and a kurtosis value close to 0 are considered normal; however, this is unlikely to achieve such values in the real world. A skewness value greater than 3 and a kurtosis value greater than 10 indicates a problem (Mardia, 1970; Kim and White, 2004). Zhang *et al.* (2020) suggests that when the sample size is greater than 200, the effect of deviation from skewness and kurtosis diminishes. The sample size of this study is 516, and the values for the skewness and kurtosis collected were found to be within the recommended range.

5.4 Structural Equation Modelling

Structural Equation Modelling (SEM) is a multivariate analysis technique used to describe the relationships among observed variables and is widely utilised in management sciences (Bielby and Hauser, 1977; Mueller and Hancock, 2018). SEM allows researchers to test or validate the theoretical models with required statistical efficiency. Researchers investigate constructs emerging from a set of variables and the relationships among these constructs (Bielby and Hauser, 1977). For example, a sales manager might investigate whether the behaviour and attitudes of salespeople directly influence sales volume. Similarly, a researcher might hypothesize that a player's overall fitness affects their sports performance, or an oncologist might explore whether high protein intake leads to breast cancer in women. Researchers use SEM to examine the relationships among sets of variables defining specific constructs to determine the adequacy of a hypothesized theoretical model for the sample data (Mueller and Hancock, 2018; Thakkar, 2020). If the model is supported by the data, researchers can incorporate additional phenomena and investigate more complex structures. If not, they may modify the basic model or develop an alternative model for testing. SEM enables a deeper investigation through scientific hypothesis testing, contributing to the understanding of complex relationships among constructs. Figure 22 illustrates the process of conducting a SEM analysis.

5.4.1 Types of Models in SEM

SEM comprises two components: the measurement model and the structural model. The measurement model connects observable indicator variables with latent constructs, which are variables not directly measured. The structural model links these latent constructs with each other (Bielby and Hauser, 1977). SEM not only assess the reliability and validity of constructs in the measurement model but also allows researchers to examine theoretical structural relationships among different latent constructs (Bielby and Hauser, 1977; Hair *et al.*, 2010). Thus, SEM analysis involves a two-stage process: first, evaluating the reliability and validity of the measurement model; and second, estimating and assessing the structural relationships (Mueller and Hancock, 2018; Thakkar, 2020).

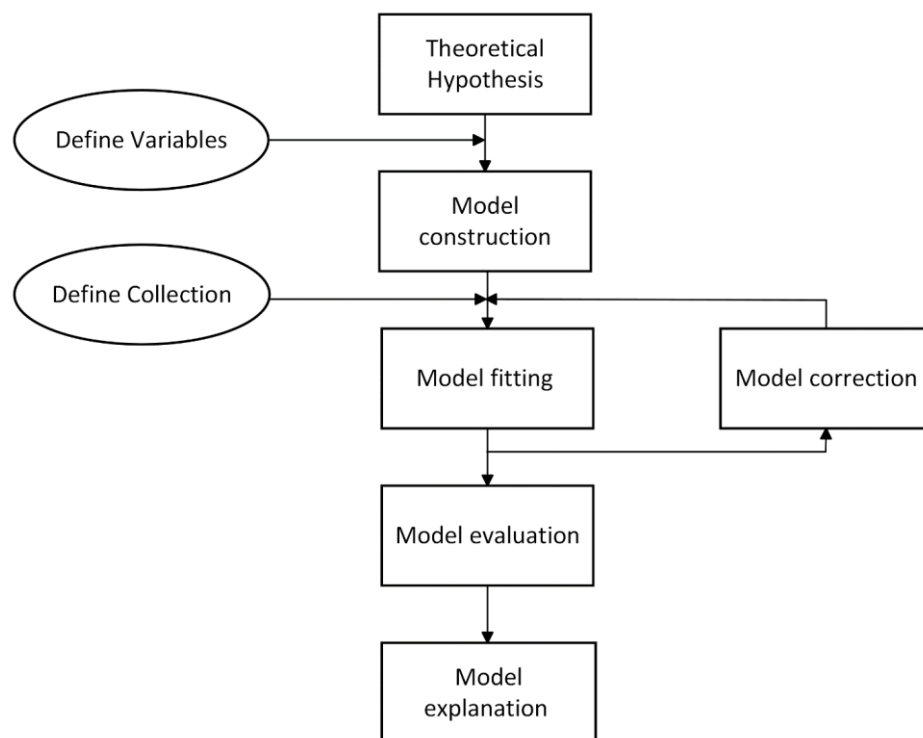


Figure 22. Process of Conducting SEM

5.4.2 SEM Approaches

There are two primary approaches to applying SEM techniques: Covariance-based SEM (CB-SEM), and variance-based SEM (VB-SEM) (Dash and Paul, 2021; Zhang, Dawson and Kline, 2021; Nichols and Edlund, 2023). CB-SEM is suitable for theory

confirmation, while VB-SEM is suitable for both theory confirmation and prediction-oriented research. Each method has different statistical assumptions and is suited to various contexts and applications. This study utilised the CB-SEM approach. The rationale for choosing CB-SEM is highlighted in Table 18.

Table 18. Comparison Between CB-SEM & VB-SEM (Source: Nicolas & Edlund 2023)

	Topic	CB-SEM	VB-SEM
Theory	Theory background	Strictly theory driven	Based on theory, but data driven
	Relation to theory	Confirmatory	Predictive
	Type of the latent measures (constructs)	Reflective indicators (<i>and</i> formative, if identified by reflective	Reflective and/or formative indicators
Model Specification	Latent variables	Factors	Components
	Model parameters	Factor means	Component weights
	Type of study	Psychometric analysis (attitudes, purchase intentions, etc.)	Driver of success, organisational constructs (market/ service/ consumer orientation, sales force, employees, etc).
	Structure of unobservable	Indeterminate	Determinate
	Reliability measures	Cronbach's α (and / or Guttman's λ and GLB)	a) Cohen's f^2 b) p_e indicator or Cronbach's α , Guttman's λ and GLB 9for the reflective models only)
	Input data	Covariance / correlation matrix	Individual-level raw data
Sample	Sample size	Ratio of sample size to free model parameters – minimum 5 observations to 1 free parameter, optimum is 10	a) Ten observations multiplied with the constructs that has highest number of indicators. b) The endogenous construct with the largest number of exogeneous constructs, multiplied with ten observations
	Data distribution assumption	Identical distribution	“soft” modelling, identified distribution is not assumed

Goodness-of-fit	Assessment of the model fit	a) Overall (absolute) fit measures b) Comparative (incremental) fit measures c) Model parsimony	a) Model predictiveness (coefficient of determination, Q^2 predictive relevance and average variance extracted –AVF
	Residual co/variance	Residual covariances are minimized for optimal parameter fit	Residual variances are minimized to obtain optimal prediction
	Software	LISREL, AMOS, etc	SmartPLS, SPSS (PLS module), etc

5.4.3 Rationale for SPSS / AMOS Approach

AMOS, integrated with SPSS, offers several significant features tailored for advanced statistical analysis and modelling. Table 19 highlights the advantages of using AMOS. Firstly, the covariance structure aligns well with the interdependency theory that is used in the qualitative part of the study. This alignment provides a robust framework for examining how variables influence each other within a system. This alignment is critical for accurately modelling complex relationships that are often interdependent.

Second, it provides a user-friendly graphical interface, enabling users to visually construct models using common online drawing tools (Ong and Puteh, 2017). This interface allows the development of attitudinal and behavioural models that capture complex relationships more accurately than traditional multivariate statistical methods, either through an intuitive graphical interface or a programmatic approach (Livote and Wyka, 2009). AMOS includes straightforward functionalities for bootstrapping methods, applicable to parameter estimates, effect estimates, sample means, variances and covariances, correlations, and model comparisons of estimation methods. Third, it also supports non-recursive models, models with fixed parameters, and models based on data from multiple populations, enhancing its flexibility and applicability in diverse research scenarios (Ong and Puteh, 2017).

Table 19. Advantages of AMOS (Source: Thakkar, 2020)

Key Features of AMOS (SPSS interface)	
<ul style="list-style-type: none"> An easy graphical interface to visually construct models with common online drawing tools. 	

<ul style="list-style-type: none"> • Can build attitudinal and behavioural models that reflect complex relationships more accurately than with standard multivariate statistics techniques using either an intuitive graphical or programmatic user interface.
<ul style="list-style-type: none"> • It has an easy-to-use interface for bootstrapping methods, which can be applied to parameter estimates, effect estimates, sample means, sample variances and covariances, correlation, model comparisons, and comparisons of estimation methods.
<ul style="list-style-type: none"> • It can accommodate non-recursive models with fixed parameters and models based on data from multiple populations.

SPSS on the other hand, provides a wide range of statistical techniques including descriptive statistics and bivariate statistics. Additionally, SPSS offers data management capabilities such as data cleaning, case selection, file reshaping, and derived data creation, making it highly versatile for handling large datasets (Miller *et al.*, 2009). SPSS complements AMOS by enhancing its capabilities for advanced statistical analysis and data management. Together, they offer a comprehensive toolkit for researchers and professionals, facilitating sophisticated analysis and accurate modelling of complex relationships in various research settings (Ong and Puteh, 2017; Thakkar, 2020).

5.5 Data Analysis

5.5.1 Construct Operationalisation

Table 20 illustrates the descriptive statistics of the constructs used in the study. Data was collected on a 5-point Likert scale, where a score of 1 indicated strongly agree and a score of 5 indicated strongly disagree.

Table 20. Descriptive Statistics for constructs

Construct		Minimum	Maximum	Mean	Std. Deviation
Awareness					
	AW1	1	5	3.45	1.008
	AW2	1	5	3.45	.991
	AW3	1	5	3.70	1.049
	AW4	1	5	4.03	.967
	AW5	1	5	3.48	.990
	AW6	1	5	3.64	.972
	AW7	1	5	3.73	.938
Knowledge					

	KN1	1	5	3.53	.893
	KN2	1	5	3.37	.924
	KN3	1	5	3.47	.904
	KN4	1	5	3.65	.951
	KN5	1	5	3.76	.865
Attitude					
	ATT1	1	5	4.08	.824
	ATT2	1	5	3.89	.902
	ATT3	1	5	3.87	.920
	ATT4	1	5	3.95	.870
Leadership					
	LD1	1	5	3.70	.895
	LD2	1	5	3.41	.929
	LD3	1	5	3.35	.999
	LD4	1	5	3.48	.934
	LD5	1	5	3.22	0.987
Sustainability Culture					
	SC1	1	5	3.28	1.003
	SC2	1	5	3.32	.988
	SC3	1	5	3.19	1.030
	SC4	1	5	3.35	.988
	SC5	1	5	3.20	1.075
	SC6	1	5	3.82	0.843
Social Pressure					
	SOCP1	1	5	3.36	.992
	SOCP2	1	5	3.34	.932
	SOCP3	1	5	3.66	.933
	SOCP4	1	5	3.40	.942
Government Regulation					
	GR1	1	5	3.44	1.012
	GR2	1	5	3.31	1.006
	GR3	1	5	3.27	1.022
	GR4	1	5	3.48	.973
	GR5	1	5	3.82	.974
	GR6	1	5	3.31	1.000
	GR7	1	5	3.29	1.062
	GR8	1	5	3.31	1.028
	GR9	1	5	3.19	1.108
Access to Infrastructure					
	AI1	1	5	3.68	.926
	AI2	1	5	3.55	.961
	AI3	1	5	3.45	.975

	AI4	1	5	3.70	.961
	AI5	1	5	3.98	.834
	AI6	1	5	3.64	.856
	AI7	1	5	3.13	1.100
	AI8	1	5	3.93	.878
	AI9	1	5	2.85	1.229
Access to Resources					
	AR1	1	5	3.01	1.100
	AR2	1	5	2.89	1.146
	AR3	1	5	3.07	1.121
	AR4	1	5	2.85	1.105
	AR5	1	5	3.10	1.096
Access to Funding					
	AF1	1	5	3.06	1.100
	AF2	1	5	2.85	1.091
	AF3	1	5	2.74	.948
	AF4	1	5	2.83	.964
	AF5	1	5	2.83	1.035
Perceived Behaviour Control					
	PBC1	1	5	2.96	1.028
	PBC2	1	5	3.76	.812
	PBC3	1	5	3.60	.909
	PBC4	1	5	3.62	.922
Intention to Use					
	IU1	1	5	3.67	.896
	IU2	1	5	3.80	.845
	IU3	1	5	3.83	.861
	IU4	1	5	3.71	.896
Actual Behaviour					
Environment	AB ENV1	1	5	3.72	.887
	AB ENV2	1	5	3.75	.862
	AB ENV3	1	5	3.62	.870
	AB ENV4	1	5	3.23	.976
	AB ENV5	1	5	3.28	1.012
Social	AB SOC1	1	5	3.95	.921
	AB SOC2	1	5	4.23	.844
	AB SOC3	1	5	3.24	1.027
	AB SOC4	1	5	3.76	.967
	AB SOC5	1	5	3.58	1.001
Governance	AB GOV1	1	5	3.51	1.004
	AB GOV2	1	5	3.71	.997
	AB GOV3	1	5	3.14	1.074
	AB GOV4	1	5	3.13	1.061
	AB GOV5	1	5	3.52	.912

5.5.2 Convergent Reliability

Items measuring the same construct should demonstrate high correlations with each other, which is indicated by Average Variance Extracted (AVE) (Thakkar, 2020). AVE values greater than 0.5 are deemed acceptable (Hair *et al.*, 2010; Mueller and Hancock, 2018; Thakkar, 2020). In this study, all calculated AVE values for the constructs were well above 0.5, confirming convergent validity. Detailed AVE results are provided in Table 21.

5.5.3 Composite Reliability

Reliability refers to the internal consistency of items and can be assessed using Cronbach's alpha coefficient (Hair et al., 2014). This coefficient is calculated based on the internal correlations among indicators. A Cronbach's alpha score above 0.7 is generally acceptable, though scores below 0.7 can be expected for psychological constructs due to their complexity (Bacon, Sauer and Young, 1995; Peterson and Kim, 2013). Cronbach's alpha is considered a conservative estimate of internal consistency, as it is sensitive to the number of items in the measurement instrument (Cho and Kim, 2015). In this study, the Cronbach's alpha scores for all items were above 0.7.

Composite Reliability (CR) is a better measure of internal consistency, as it accounts for the outer loadings of indicators. CR values between 0.6 and 0.7 are acceptable, and values above 0.7 are satisfactory (Peterson and Kim, 2013). To improve the CR scores the following variables were dropped. From the Knowledge scale KN1, sustainability culture scale: SC1 and SC6, government regulation scale: GR2, GR3, GR5 and GR6, perceived behaviour control (PBC): PBC1, access to infrastructure scale: AI1, AI2, AI5, AI7 and AI9, access to resources scale: AR5 and lastly from the access to funding scale AF1 and AF2 were removed to improve the composite reliability scores. Detailed reliability scores for all items are in Table 21.

Table 21. Construct Reliability and Validity

Variables	Items	Standardised Factor Loadings	Cronbach Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
Awareness	AW2	0.543	0.804	0.816	0.534
	AW5	0.726			
	AW6	0.848			
	AW7	0.766			
Knowledge	KN5	0.775	0.822	0.821	0.54
	KN4	0.657			
	KN3	0.765			
	KN2	0.721			
Attitude	ATT1	0.777	0.914	0.876	0.63
	ATT2	0.807			
	ATT3	0.781			
	ATT4	0.83			
Leadership	LD1	0.735	0.812	0.814	0.60
	LD2	0.797			
	LD5	0.778			
Sustainability Culture	SC2	0.84	0.904	0.898	0.68
	SC3	0.795			
	SC4	0.864			
	SC5	0.818			
Social Pressure	SOC P1	0.798	0.795	0.796	0.56
	SOC P2	0.763			
	SOC P3	0.693			

	SOCP4	0.776			
Government Regulation	GR1	0.617	0.871	0.875	0.58
	GR4	0.768			
	GR7	0.773			
	GR8	0.822			
	GR9	0.825			
Subjective Norms	SUBN1	0.822	0.821	0.735	0.67
	SUBN3	0.763			
	SUBN4	0.791			
Access to Infrastructure	AI8	0.636	0.797	0.759	0.51
	AI6	0.674			
	AI4	0.647			
	AI3	0.802			
Access to Resources	AR1	0.702	0.846	0.846	0.57
	AR2	0.771			
	AR3	0.781			
	AR4	0.786			
Access to Funding	AF3	0.840	0.865	0.869	0.68
	AF4	0.868			
	AF5	0.779			
Perceived Behaviour Control	PBC4	0.735	0.808	0.773	0.53
	PBC3	0.729			
	PBC2	0.723			
Intention to Use	IU1	0.804	0.915	0.864	0.61
	IU2	0.773			
	IU3	0.784			

	IU4	0.77			
Actual Behaviour	ENVB	0.787	0.805	0.887	0.72
	SOCB	0.842			
	GOVB	0.919			

5.5.4 Discriminant Validity

Discriminant validity refers to the degree to which two constructs are empirically distinct from each other (Bielby and Hauser, 1977; Mueller and Hancock, 2018). This indicates that each construct is unique and captures a trait not reflected by other constructs in the model. Discriminant validity in the model was assessed using two methods (i) examining cross-loadings (Bagozzi and Yi, 1988; Kelloway, 1995) and (ii) applying the Fornell and Larcker (1981) criterion. During the cross-loadings examination, six items (AW1, AW3, AW4, LD3, LD4, ENV1, ENV5, SOC2, SOC3, SOC5, GOV3 and GOV4) were removed to achieve discriminant validity (Barrett, 2007). According to the Fornell and Larcker (1981) criterion, discriminant validity is confirmed if the square root of the AVE of a construct exceeds its highest correlation with any other construct in a correlation matrix (Bielby and Hauser, 1977; Mueller and Hancock, 2018).

Table 22 presents a correlation matrix of the constructs used in the model, with bold numbers along the diagonal representing the square root of the average variance extracted (AVE), confirming that the Fornell and Larcker criterion is met and that the discriminant validity is established. In our analysis, the square root of the average variance extracted values suggests that while several constructs, such as awareness and knowledge, exhibit high correlation (0.733), this does not necessarily violate discriminant validity as they are expected to relate closely within the sustainability context as knowledge may shape positive attitude towards sustainability (see Becker and Green 2019). However, it is noted that the construct Access to Infrastructure shows low values - 0.568 with (awareness), 0.573 (attitude), 0.571 (sustainability culture), 0.604 (social pressure), 0.609 (subjective norms) and 0.603 (perceived behaviour control). In sustainability research, it is common for constructs to overlap given the practical relevance of the construct (Recker and Green, 2019).

Table 22. Discriminant Validity

	Awar	Know	Attitude	Leader	SusCul	SocP	GovReg	SubNorms	PBC	AccInfra	AccRes	AccFun
Awar	0.720											
Know	0.651	0.718										
Attitude	0.633	0.733	0.831									
Leader	0.613	0.583	0.662	0.795								
SusCul	0.618	0.587	0.658	0.601	0.793							
SocP	0.444	0.399	0.388	0.47	0.496	0.708						
GovReg	0.519	0.434	0.484	0.461	0.528	0.47	0.731					
SubNorms	0.593	0.600	0.585	0.647	0.616	0.66	0.608	0.831				
PBC	0.454	0.505	0.544	0.571	0.564	0.585	0.423	0.46	0.600			
AccInfra	0.568	0.511	0.573	0.540	0.571	0.604	0.448	0.609	0.603	0.567		
AccRes	0.456	0.396	0.467	0.407	0.543	0.593	0.442	0.500	0.501	0.600	0.757	
AccFun	0.41	0.33	0.439	0.356	0.514	0.533	0.461	0.478	0.415	0.559	0.675	0.793

The construct access to infrastructure is not always independent in the real-world setting. Furthermore, as noted by Hair *et al.*, (2010), minor correlations exceeding the square root of the Average Variance Extracted (AVE) between constructs in a structural equation model do not inherently signify a significant breach of discriminant validity especially in complex social science models evaluating behaviours. For example, Álvarez Jaramillo, Zartha Sossa and Orozco Mendoza (2019) suggest that sustainability behaviour in SMEs can be influenced by a combination of internal and external factors. A study by Ikram et al. (2021) indicates that models examining the adoption of green technologies in SMEs may exhibit overlap in constructs. This does not undermine the model. Rather it underscores the interdependence of the various factors in real-world decision making. Therefore, it can be justified that access to infrastructure can enable and reinforce attitudes, norms and perceived behaviour control. This minor overlap aligns with real-world observations.

5.6 Structural Model and Hypothesis Testing

After testing the reliability and validity of the variables, the next step is to evaluate the structural model (see Figure 23), focusing on the relationships between constructs and the model's predictive capabilities (Dash and Paul, 2021; Zhang, Dawson and Kline, 2021). This involves assessing the path coefficients, examining the R^2 value and determining the predictive relevance Q^2 (Hair *et al.*, 2010; Blunch, 2012). Table 23 outlines each criterion and the acceptable threshold values.

Table 23. Assessment Criteria for Structural Model (Source: Hair et al., 2010)

Structural Model Assessment Criterion	Description	Acceptable Threshold
Path Coefficient	Path coefficients represent the hypothesised relationships between constructs. Their value is evaluated in terms of	$t > 1.96$, $p < 0.05$ (significance level = 5%) $t > 2.57$, $p < 0.01$ (significance level = 1%) (Hair et al., 2014)

	size and significance (Hair et al., 2014).	
Coefficient Determination- R² value	The R ² value is a measure of the predictive power of the model. It represents a variance of the construct explained by the model (Chin, 2010)	R ² =0.67 (Substantial) R ² =0.33 (Moderate) R ² = 0.19 (Weak) (Chin 1998b; Henseler Ringle & Sinkovics, 2009)
Effect Size – f²	f ² is the size of the effect of the R ² value when an independent variable is deleted from the model. Effect size indicates whether the deletion of the independent variable has a significant impact on the dependent variable (Hair et al., 2014)	f ² =0.35 (Large) f ² =0.15 (Medium) f ² =0.02 (Weak) (Chin, 1998b)
Predictive relevance –Q² value	A Q ² value above zero for a particular dependent variable indicates that the SEM model has predictive relevance for the construct under examination (Chin 1998b)	Q ² >0 (Chin, 1998b)

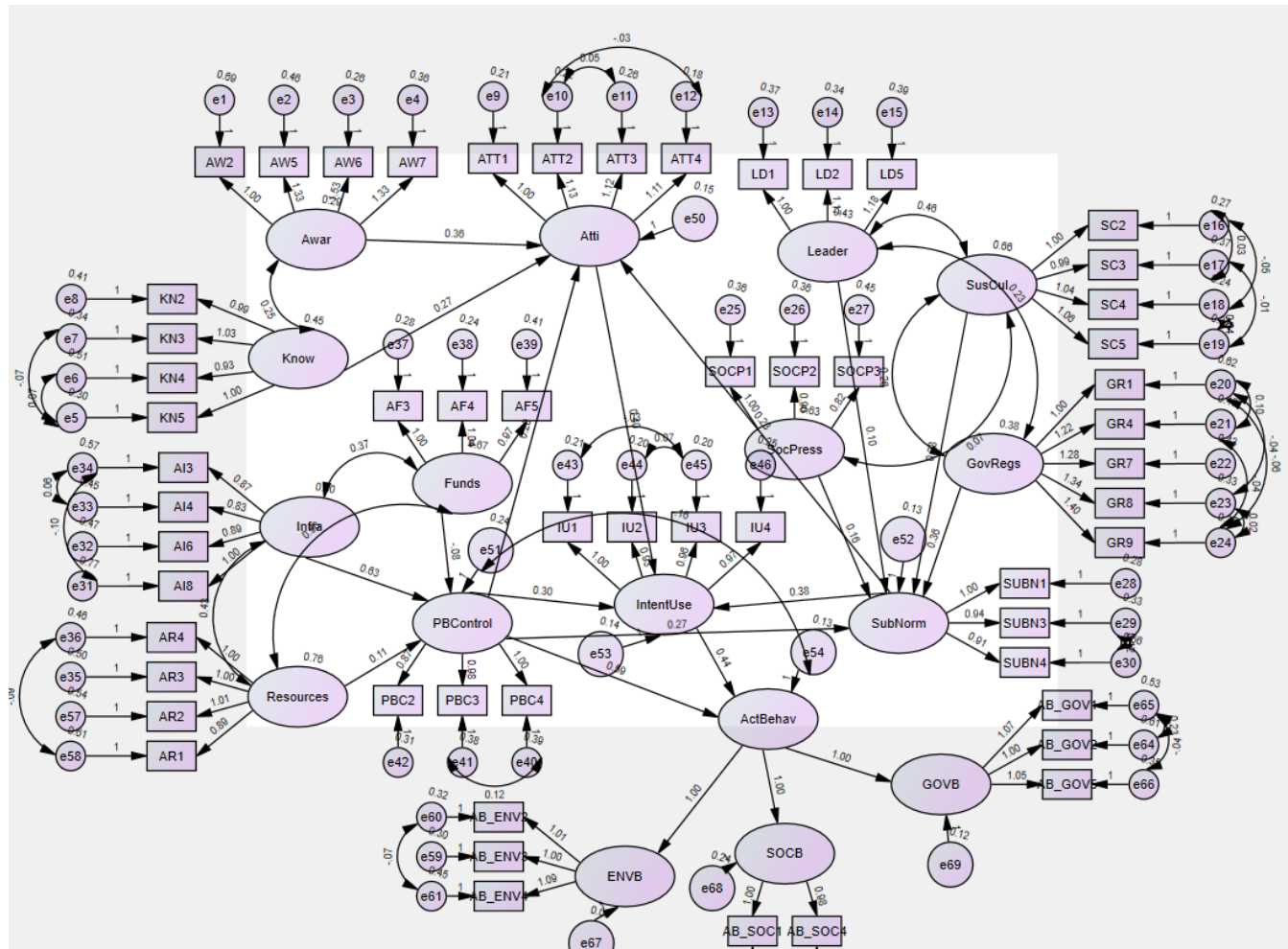


Figure 23. Structural Model

5.6.1 Model Fit Summary

Table 24 indicates the model fit summary of the structural model (Fig 23). The SEM analysis indicates a generally acceptable model fit, given the size of the data and the complexity of the model. The CMIN/DF ratio of 2.747 falls within the acceptable range indicating a reasonable fit. The Goodness-of-fit Index (GFI) is (.783) and the Adjusted Goodness-of-fit Index (AGFI) is (.759) slightly below the ideal but still reflects meaningful alignment with the data. Key comparative indices, including the CFI (0.864) and TLI (0.854), indicate a solid baseline model that captures essential structural relationships. Moreover, the Root Mean Square Error of Approximation (RSMEA) of .058, along with a narrow confidence interval, strongly suggests model fit and stability, affirming the model's reliability.

Table 24. Model Fit Summary

Fit Indices	Obtained Value
P	.000
CMIN/df	2.747
GFI	.783
CFI	.864
TLI	.854
RMSEA	.058

Supporting the model's robustness, the default model demonstrated a good balance fit and parsimony, with an Akaike Information Criterion (AIC) of 4263.281 and the Expected Cross-Validation Index (ECVI) of 8.278, which falls within the 90% confidence interval (7.923-8.648). The default model was 4263.281, significantly lower than the independence model (20110.128), confirming a much better fit to the data. While the saturated model had the lowest AIC (3192.000) and ECVI (6.198), it is overfitted and impractical for generalisation. According to Schumacker and Lomax (2016, 233), "the goal of SEM is parsimony, where simpler models are preferred over saturated ones, which tend to overfit data and lack predictive utility." Therefore, the default model vastly outperformed the Independence Model (AIC=20110.128; ECVI=39.049), confirming its suitability for the data.

Table 25 illustrates the AIC and ECVI values. Furthermore, Hoelter's Critical N value of 200 confirms the model's adequacy for this sample size, demonstrating statistical soundness. While GFI, AGFI, and RMR suggest minor areas for

enhancement, the model's theoretical foundation and acceptable indices underscore its validity in exploring sustainability adoption among SMEs.

Table 25. AIC and ECVI values

AIC				
	AIC	BCC	BIC	CAIC
Default Model	4263.281	4303.604	4951.150	5113.150
Saturated Model	3192.000	3589.258	9968.786	11564.786
Independence Model	20110.128	20124.066	20347.910	20403.910
ECVI				
	ECVI	LO90	HI90	MECVI
Default Model	8.278	7.923	8.648	8.357
Saturated Model	6.198	6.198	6.198	6.969
Independence Model	39.049	38.169	39.941	39.076

5.6.1 Structural Paths and Coefficients (RQ1 Findings)

The results of the hypothesis are shown in Table 26. Key findings are as follows:

- Perceived behavioural control (PBC) is significantly impacted by infrastructure with a coefficient of .627 ($p < .001$), suggesting that better infrastructure strongly enhances PBC.
- However, access to resources and access to funds do not significantly affect PBC, with p-values of .058 and .164 respectively.
- Subjective norms (SubNorms) are positively influenced by social pressure (SocPress, $\beta = .165$, $p < .001$), government regulations (GovRegs, $\beta = .361$, $p < .001$), sustainability culture (SusCul, $\beta = .282$, $p = .003$), and perceived behavioural control (PBControl, $\beta = .268$, $p < .001$).
- Leadership (Leader) does not significantly impact subjective norm ($p = .424$). This issue deserves future examination, particularly given the importance of leadership in shaping behaviour (Liao, 2022) and scholarly research on sustainability leadership lacks coherence and is fragmented (Eustachio, Caldana and Leal Filho, 2023; Sajjad, Eweje and Raziq, 2024). To illustrate, a recent study on empowerment and knowledge sharing, both important for advancing desired organisational outcomes such as improving innovation

performance, shows, power distance can undermine both, but strengthens compliance (Dong *et al.*, 2022).

- Attitude is significantly shaped by awareness (Awar, $\beta = .358$, $p < .001$), knowledge (Know, $\beta = .274$, $p < .001$), perceived behavioural control (PBControl, $\beta = .199$, $p < .001$), and subjective norm (SubNorms, $\beta = .228$, $p < .001$), suggesting that increased awareness and knowledge strengthen positive attitudes towards sustainability.
- Intention to use (IntentUse) sustainability practices is significantly influenced by attitude (Atti, $\beta = .401$, $p < .001$), perceived behavioural control (PBControl, $\beta = .299$, $p < .001$), and subjective norm (SubNorms, $\beta = .379$, $p < .001$). This indicates that favourable attitudes, norms, and behavioural control increase the likelihood of adoption.
- Lastly, actual behaviour (ActBehav) is strongly affected by intention to use (IntentUse, $\beta = .444$, $p < .001$) and perceived behavioural control (PBControl, $\beta = .594$, $p < .001$), demonstrating that intentions and control perceptions are critical drivers of actual adoption behaviour.

Table 26. Hypotheses Results

Hypothesis	Path	Estimate	Standard Error	Critical Ratio	P-value	Result
H1a: Environmental awareness is positively related to the attitude towards sustainability practices.	Awar → Atti	.358	.074	4.864	***	Supported
H1b: Environmental knowledge is positively related to the attitude towards sustainability practices.	Know → Atti	.274	.058	4.734	***	Supported
H2a: Leadership positively influences subjective norms.	Leader → SubNorms	.099	.124	.800	.424	Not Supported
H2b: A strong sustainability culture within an organisation positively influences subjective norms.	SusCul → SubNorms	.282	.094	3.011	.003	Supported
H2c: Social pressure positively influences subjective norms.	SocPress → SubNorms	.165	.036	4.557	***	Supported
H2d: Government regulation influences social norms.	GovRegs → SubNorms	.361	.060	5.989	***	Supported
H3a: Access to infrastructure positively influences perceived behaviour control.	Infra → PBControl	.627	.085	7.348	***	Supported
H3b: Access to resources positively influences perceived behaviour control.	Resources → PBControl	.111	.058	1.896	.058	Not Supported
H3c: Access to funding positively influences perceived behaviour control.	Funds → PBControl	-.076	.054	-1.393	.164	Not Supported
H4: Perceived behaviour control positively influences subjective norms.	PBControl → SubNorms	.268	.043	6.208	***	Supported
H5: Subjective Norms positively influence attitudes towards sustainability practices.	SubNorm → Atti	.228	.041	5.626	***	Supported

H6: Perceived behaviour control positively influences attitudes toward sustainability practices.	PBControl → Atti	.199	.038	5.207	***	Supported
H7: Attitude positively influence the intention to use sustainability practices.	Atti → IntentUse	.401	.048	8.333	***	Supported
H8: Perceived behaviour control positively influences the intention to use sustainability practices.	PBControl → IntentUse	.299	.043	6.908	***	Supported
H9: Subjected Norms positively influence the intention to use sustainability practices	SubNorm → IntentUse	.379	.046	8.267	***	Supported
H10: Perceived behaviour control positively influence actual adoption behaviour.	PBControl → ActBehav	.594	.065	9.194	***	Supported
H11: The intention to adopt sustainability practices positively influences actual adoption behaviour.	IntentUse → ActBehav	.444	.041	10.711	***	Supported

*** $p < .001$

5.7 RQ1 Discussion

The study highlights several factors that influence the uptake of sustainability practices by SME owners, with significant implications for both theory and practice. RQ1 reveals strong actor awareness, but that key organisational (Pg.145) and structural characteristics (Pg. 146) are deficient. This finding is contrary to literature (see pg. 83) that reported a growing recognition of the pivotal roles by leadership in organisational success (Ranabahu and Wickramasinghe, 2022). Central ideas determining leadership effectiveness include strategic leadership (thinking long-term) and setting sustainable goals. There is also a need to foster a culture of environmental and social responsibility throughout the organisation (Jardon and Martínez-Cobas, 2019).

5.7.1 Actor Characteristics

The results for H1a ($\beta = .358, p < .001$) and H1b ($\beta = .274, p < .001$) show that business owners who have environmental knowledge and environmental awareness have positive attitudes towards sustainability practices. This finding is well aligned with literature (Ahmed *et al.*, 2021; Heydari, Govindan and Basiri, 2021). Since SME owners are the primary decision-makers, they rely on their knowledge and awareness of environmental issues to evaluate whether they want to invest in sustainability practices. Positive attitudes may arise when SME owners recognise the potential benefit of cost savings, improved market reputation and environmental advantages. Studies indicate that business owners who perceive a direct alignment between sustainability and business growth are more inclined to adopt sustainability practices in their business. Therefore, the development of positive attitudes among SME owners is a critical precursor to behavioural intentions.

5.7.2 Organisational Characteristics

Hypothesis H2a, which suggested that leadership would positively influence subjective norms, was not supported ($p = .424$). This result contradicts some studies which argue that leadership often sets organisational expectations, including norms around sustainability practices (Muralidharan and Pathak, 2018; Burawat, 2019; Asad *et al.*, 2021). However, it is possible that within the SME context, subjective norms

may be shaped more by external pressure than internal leadership, suggesting that in small organisations, leadership alone may not exert a significant influence on sustainability norms. An underlying explanation could also be that managerial leadership is in deficit i.e., business owners lack opportunity-seeking and risk-taking behaviours and are focused on survival, and the business models of these SMEs shape the owner/manager's behaviours when it comes to implementing sustainability practices. This latter idea is consistent with Tyler et al., (2024) finding that the nuanced roles of proactive orientation and regulatory pressure in motivating SMEs to adopt more environmental practices, warrants new research directions.

Next, H2b, which states that sustainability culture within the organisation positively influences subjective norms – the result reflects the literature on organisational culture, which asserts that a strong sustainability culture can create a collective mindset supporting sustainability efforts (Galpin, Whittington and Bell, 2015; Pennington and More, 2016; Isensee *et al.*, 2020; Ketprapakorn and Kantabutra, 2022). A culture that prioritizes sustainability encourages employees to align their behaviours with organizational values, thus strengthening subjective norms (Gupta and Kumar, 2013; Marshall *et al.*, 2015a). The implication here is that SMEs need to cultivate a sustainability-driven culture with norms that support green initiatives and behaviour among employees.

H2c ($H2c, \beta = .165, p < .001$) and H2d ($H2d, \beta = .361, p < .001$) suggest that social pressure and government regulation positively influence subjective norms. These findings highlights the role of external forces in shaping sustainability behaviour (Rahim, 2013; Haji, Coram and Troshani, 2022; Redondo Alamillos and de Mariz, 2022). Social pressure or the influence of peers and societal expectations, has been shown to drive individuals and organisations toward more sustainable practices (Surroca, Tribó and Zahra, 2013; Cantele and Zardini, 2020; Ernst *et al.*, 2022). SME owners who often face social pressure from their customers, stakeholders or competitors are more likely to adopt sustainability practices. Government regulation further solidifies these norms by mandating compliance with sustainability standards, which is a strong motivator for businesses to adopt sustainable practices (Dohmen *et al.*, 2011; Wagner and Lutz, 2017). These findings suggest SMEs are not only influenced by internal drivers but shaped by the social and regulatory environment.

5.7.3 Structural Characteristics

Access to infrastructure (H3a, $\beta = .627$, $p < .001$) strongly influences perceived behavioural control (PBC). Infrastructure includes physical structures like green technology, green supply chains (transportation networks) and waste management systems which are essential for supporting sustainability initiatives. The availability of this infrastructure facilitates operational efficiency. SMEs that have access to such infrastructure will most likely adopt sustainability practices like recycling, using renewable energy or sustainable products.

In contrast, access to resources (H3b, $\beta = .111$, $p = .058$) and funding (H3c, $\beta = -.076$, $p = .164$) show no significant effects. These findings align with previous research indicating that while resources and funding are necessary, they may not be sufficient to empower SMEs in sustainability practices unless paired with other enablers, like infrastructure or strategy planning (Zhang, Li and Ziegelmayer, 2009; Audretsch, Heger and Veith, 2015; Hahn *et al.*, 2015a; Thacker *et al.*, 2019; Shahzad *et al.*, 2020). These non-significant results suggest that a holistic approach, integrating infrastructure with resources, may be essential to enhancing SMEs' perceptions of control over sustainability actions, supporting the view that sustainability adoption is influenced by complex interdependencies within and outside organisational settings.

5.7.4 Behavioural Intentions and Adoption

These findings extend the application of the Theory of Planned Behaviour to sustainability adoption in SMEs, where resource constraints are prevalent. Attitudes (H7, $\beta = .401$, $p < .001$), PBC (H8, $\beta = .299$, $p < .001$) and subjective norms (H9, $\beta = .379$, $p < .001$), are all significant predictors of the intention to adopt sustainability practices. This is consistent with the theory of planned behaviour, which states that attitude, subjective norms, and perceived behaviour control drive intention. The strong predictive relationship between intention (H11, $\beta = .444$, $p < .001$) and actual adoption behaviour reaffirms the role of intention as a key driver of action. However, the even stronger influence of PBC on actual adoption (H10, $\beta = .594$, $p < .001$) underscores the importance of facilitating conditions that enable action.

While intention denotes the “will” to act, PBC signifies the “means” to act, indicating that SME owners may require both motivation and tangible support systems (structures) to adopt sustainability practices. These findings also highlight the importance of interdependence between psychological factors and environmental factors. For example, even the most highly motivated business owner may struggle to adopt sustainability practices without adequate infrastructure or supportive policies. Conversely, enabling factors (conditions) may attract less-driven SMEs to participate in sustainability by simplifying the implementation process. This interplay highlights the necessity for a twofold strategy that requires cultivating psychological readiness (mindset) and building/creating an enabling environment (ecosystem).

5.8 Chapter Five Summary

This chapter explored RQ1: What factors influence the implementation of sustainability practices in SMEs? The analysis identified several key drivers, including environmental awareness, knowledge, and organisational culture as exerting a positive influence on SME owners' attitudes toward sustainability. Subjective norms and perceived behavioural control also play important roles. However, some hypotheses, particularly those related to leadership and resources, were not supported. The lack of support for leadership's influence on subjective norms suggests that in Irish SMEs, leadership may not be the primary driver of sustainability, possibly due to the personal nature of decision-making in smaller firms. Similarly, access to resources and funding were insufficient to influence perceived behavioural control on its own, highlighting the need for an integrated approach, with infrastructure a key enabling consideration.

The chapter concludes that sustainability adoption in SMEs is shaped positively (and negatively) by both internal, including leadership and awareness, and external factors, such as infrastructure, culture, government regulation, and social pressure. These findings set the stage for the next chapter, which explores RQ2: What are the structural and environmental interdependencies that impact the uptake of sustainability practices in Irish SMEs? Qualitative data (RQ2) might better explain why these hypotheses are not supported. The factors noted above are identified in RO5 (Figure 30) as antecedents or predictors of actions and policies and also in owner Agency.

Chapter 6: Qualitative Findings and Discussion

6.1 Introduction

The study's aim is to develop *a better understanding of the awareness of sustainability and associated practices by SME owners and to extend this understanding towards activating the collective potential of small businesses as environmental agents* (Smith et al., 2022). Chapter 5 presented the findings related to owner 'intention' towards uptake from the QUANT phase of the study. The data revealed strong positive awareness and attitude towards sustainability, but internal to small businesses the absence of strategic planning and leadership, as well as time and cost-related considerations. External factors that appear significant is the absence of regulatory control, uncertainty over governance requirements and limited influence of customer norms on SME owner behaviour.

Knowing structure reliably influences behaviour (Van Lange et al., 2015), this chapter presents the qualitative analysis and findings related to RQ2, an exploratory study of *structural interdependencies impacting the uptake of sustainability practice*. Analysis is based principally on Interdependence Theory (Kelley, 1978; Thibaut, 2017) in order to address the following two subordinate Research Objectives:

- RO4: What are the actor vs situational characteristics in Irish SMEs in relation to sustainability practices?
- RO5: Identify a framework to support sustainability practices in Irish SMEs.

Data analysis is based on responses to open-ended questions included in the survey, 5 semi-structured interviews with business owners and secondary data from 30 business reports of local SMEs. (Kelley, 1978; Thibaut, 2017). Exploration of emerging themes in participant voices is supported by theoretical frameworks such as Social Capital Theory (Dubos, 2017), the Competing Values Framework (Quinn *et al.*, 1991) and Structuration Theory (Stones and Jack, 2016). The latter theory, which extends earlier theory by Giddens (1993), is a critical lens that has been used successfully in a number of disciplines including: healthcare, management, accounting, education and childcare

(Gioia, Corley and Hamilton, 2013a; Murphy, Klotz and Kreiner, 2017; Magnani and Gioia, 2023), as well as in sustainability (Stirk 2021; Steiner et al., 2021; Tabares et al., 2021). Pertinently, as recent research has noted, while there is an often-repeated perception that sustainability must be achieved by capable agents and their respective capabilities (Salovaara and Hagolani-Albov, 2024), this study, consistent with Van Lange and Balliet (2015), would add significant attention must also be given to the structures within which the activities take place.

The subsequent narrative analysis, which is a common technique used in qualitative research, was completed using the Gioia methodology (Gioia *et al.*, 2013). This approach presents participant voices that are subsequently integrated with theoretical viewpoints using theories (such as structuration) to present the contextual interdependencies that appear to influence decision-making and related behaviour. Accepting the relationship between individuals and social structures is key per structuration theory, the prospective relationship are best understood by breaking the analysis down into four connected parts: *external structures* (like laws and social norms), *internal structures* (like personal beliefs, values and knowledge), people's *actions*, and the *outcomes* of those actions (Stones and Jack, 2016). Subsequent investigation of specific data provides an opportunity to make a substantial contribution to the theoretical field (Gephart Jr, 2004; Eisenhardt and Graebner, 2007).

6.2 Participant's Profile

We begin this narrative analysis by reporting the personal profiles of Participants, who are all small business owners in Ireland. The inclusion of personal profiles reported in Table 27, serves several important functions. First, it enhances the contextual richness and depth of the study, and it allows for a nuanced understanding of the individual narratives (Eisenhardt and Graebner, 2007). Second, it also enables the researcher to better interpret the subtleties and complexities of stories (Locke, Feldman and Golden-Biddle, 2022). These attributes ensure findings are grounded in the empirical data and reflect the unique perspectives and lived experiences of participants (Stones and Jack, 2016; Lê and Schmid, 2022).

Table 27. Participant Profiles

Participant	Gender	Education	Sector	Experience	Employees
P1	Female	PhD	Publishing	>18 years	5
P2	Male	Masters	Services	>10 years	4
P3	Male	Masters	Services	>19 years	10
P4	Male	Bachelors	Electronics	>20 years	8
P5	Male	Masters	Transportation	> 15 years	15

6.3 Narrative of the Participants

The narratives of these business owners in this study showcase a variety of experience and challenges faced when it comes to the adoption of sustainability practices. While there are common factors shared by these business owners, each narrative outlines distinct experiences. The narratives of these business owners are presented in the following section.

6.3.1 Participant 1 (Publishing)

Participant 1 is a founder and co-director of a family-run publishing business established in 2006. The business specialises in producing educational materials, including language courses, in both digital and print formats. Participant 1's approach to sustainability in her business is primarily driven by cost savings rather than environmental concerns. The shift to digital platforms was a strategic response to increased shipping costs due to Brexit. While sustainability practices, such as digitalisation and recycling, are implemented, they are not pursued for their environmental benefits but for their economic advantages.

Participant 1 acknowledges the potential benefits of sustainable practices but emphasises that costs are the overriding factor influencing business decisions. She expressed scepticism about industry competitors' sustainability efforts and highlighted the absence of governmental or industry mandates for sustainability reporting in her sector. Although Participant 1 is aware of grants and subsidies for sustainable practices, she finds them unappealing due to the upfront investments required. She believes that the primary concern for her and similar small business owners is the potential for forced sustainability measures that could increase costs and threaten

profitability. Overall, while ethical considerations sometimes influence business decisions, profitability remains the paramount concern for Participant 1 and her business.

- Key drivers: Cost Savings, Profitability focus
- Key constraints: Scepticism about competitors

6.3.2 Participant 2 (Services)

Participant 2 is a project manager leading a European-funded sustainability initiative. With over 10 years of experience, this individual also founded a consultancy that supports start-ups and small businesses in areas such as marketing, product management and business development. Participant 2's extensive background in running a consultancy business allows him to provide strategic insights and practical solutions, emphasizing simplicity and tangible benefits to ensure successful implementation and sustainable growth for his clients.

Participant 2 advocates a practical and strategic approach to sustainability. He emphasises the importance of integrating sustainability into business practices not just as a moral imperative but as a driver of growth and innovation. He believes that sustainable practices can lead to efficiency gains, cost savings, and enhanced brand reputation. His approach involves identifying areas where sustainability initiatives can provide tangible benefits, ensuring that they are simple to implement and align with overall business strategy. He sees sustainability as a crucial element in achieving long-term success and competitiveness in the market.

- Key drivers: Strategic Simplicity, tangible benefits, and business strategy.
- Key constraints: limited understanding of sustainability and complexity.

6.3.3 Participant 3 (Services)

Participant 3 is an entrepreneur with a strong background in computer science and IT management, holding a degree in the field since the late 1990s. His career began as a computer programmer in a company connected to the airline and freight industry,

where they experienced the early developments of the internet and the emergence of online payments in the mid-1990s. His journey in the business world includes a significant tenure as an IT manager, where he played a pivotal role in transitioning business operations to the web and developing online systems for customer feedback and payment processing.

After an attempt at a management buyout and subsequent departure from his previous company, this participant founded their own IT business, specialising in website development and online platforms. In 2003, leveraging his expertise and network, he co-founded a travel insurance business with two partners, taking on the role of IT lead. Their vision led to the creation of a direct-to-consumer travel insurance product in 2007 which later integrated with UK comparison engines through an advanced XML API layer. This innovation focused on annual travel insurance and implementing an automated renewal system, notably coincided with the global financial crisis (GFC) in 2008, the company still maintained profitability through effective customer retention and reduced acquisition costs. The ability to anticipate market trends and adapt to changing consumer behaviours was instrumental in business success.

Participant 3's views on sustainability are pragmatic and cost focused. His emphasis, while striving to meet sustainability requirements, is that adhering to them to the last detail can be prohibitively expensive. He describes the financial pressures of starting a business, including the need to pay employees and cover basic operational costs, leaving little room for additional expenses such as those associated with strict sustainability practices. He acknowledges that even as his business grew and became profitable, cost concerns remained paramount. He cites the example of negotiating the price of fruit deliveries even when the business was turning over significant profits. This illustrates his belief that cost efficiency is deeply ingrained in the mindset of business owners, regardless of the business's scale.

When discussing the integration of sustainability into business practices, Participant 3 recognized widespread awareness of climate change and sustainability among business owners. However, he says many SMEs are hesitant to adopt sustainable practices unless they see a clear financial benefit or a significant shift in market demand. He also said some owners viewed sustainability initiatives as

unnecessary unless they directly contribute to profitability or align with customer expectations. He is open to change and innovation, noting his business was characterized by constant evolution and willingness to adapt, but admits sustainability was not a core focus. He suggests it would be easier to incorporate sustainability from the outset, rather than trying to retrofit existing practices.

Regarding the motivation to adopt sustainability, Participant 3 identifies two main drivers: market opportunities and changes in customer attitudes. He warns against superficial "greenwashing" efforts, where companies make insincere or token gestures towards sustainability without meaningful impact. He believes that genuine sustainability requires deep integration (strategy planning) into the company's values and operations. If he were to start a new business today, P3 indicated that he would prioritise sustainability as a core value. He acknowledges the role of government incentives in encouraging businesses to adopt renewable energy and other sustainable practices. He also recognizes that his current understanding of sustainability is limited, and he emphasises the need for continuous learning and adaptation.

- Key drivers: Cost & service delivery, technical expertise, local sourcing and customer relationships.
- Key constraints: Financial implications.

6.3.4 Participant 4 (Electronics)

Participant 4 is a professional with an extensive background in manufacturing and operations, deeply rooted in a family tradition of entrepreneurial endeavours in the manufacturing sector. Throughout his career, he has garnered substantial experience working for several prominent multinational companies. This diverse portfolio has equipped him with a broad understanding of both the strategic and operational aspects of large-scale enterprises. Currently, he holds the interim position of Chief Operating Officer (COO) at a small business that is dedicated to mitigating urban congestion through sustainable transportation solutions, primarily focusing on e-bikes.

His role involves a comprehensive review of the company's operations, excluding sales and marketing, to determine necessary improvements and next steps for the organisation. His interim tenure is focused on optimizing operational

efficiencies and ensuring the company's mission aligns with its operational practices. The company he works for specialises in providing e-bikes on a lease basis to business clients, offering fleets ranging from 100 to 500 bikes under three-year contracts. These contracts include full-service maintenance, ensuring clients benefit from a hassle-free, sustainable transportation solution. This model supports urban mobility while promoting environmental sustainability by reducing the reliance on cars and vans.

Participant 4 is passionate about sustainability and the circular economy. Under his leadership, the company emphasises refurbishing and repairing e-bike batteries rather than replacing them, sourcing parts from within Europe to minimize the carbon footprint and extending the lifecycle of bikes through comprehensive maintenance. These practices not only enhance sustainability but also aim to lower costs and improve service delivery. Despite the company's focus on B2B transactions, where cost efficiency often takes precedence over sustainability credentials, P4 believes in the long-term benefits of sustainable practices. He advocates for the local sourcing of components and the importance of building reliable, strategic relationships with local vendors to improve turnaround times and quality. His approach reflects a commitment to integrating sustainable practices into business operations, ultimately aiming to achieve lower costs and better service. His philosophy is rooted in the belief that sustainability when executed correctly, can lead to improved cost efficiency and service quality. His leadership in the company's interim phase is instrumental in steering the organisation towards a future where sustainable practices are not only environmentally beneficial but also economically advantageous.

- Key drivers: strategic mindset and passion for sustainability
- Key constraints: High cost

6.3.5 Participant 5 (Transportation)

Participant 5 is the Founder and Managing Director of a consultancy established in 2009. With over a decade of experience, he has honed his expertise in procurement best practices and facilitating successful engagements between SMEs and large organisations. His consultancy advises a diverse range of clients, including global giants like Google, on optimizing procurement processes and navigating complex tendering procedures. His firm specializes in guiding SMEs through the intricacies of

bidding for contracts with major corporations, providing essential support that ensures these smaller companies can compete effectively. Although he is not a solicitor, his deep understanding of contract law, studied during his college years, and his practical experience in commercial negotiations, enable him to offer robust advice from a commercial and risk management perspective. When specialized legal input is required, he collaborates with in-house or external legal teams to deliver comprehensive solutions. Predominantly serving clients in the technology sector, his portfolio also includes large organisations from various industries, such as retail and FMCG and other industries.

Over the years, P5 has witnessed a significant shift towards sustainability in business practices. While large corporations often approach sustainability as a box-ticking exercise driven by regulatory requirements and CSR mandates, SMEs typically adopt sustainable practices more genuinely, motivated by the personal values of their founders and employees. He advocates for incentivizing sustainability through simplified tax credits, believing that straightforward incentives would encourage more SMEs to adopt sustainable practices. Personally committed to sustainability, he integrates these principles into both his personal and professional life, reflecting his belief that genuine commitment often starts with individual actions and values. He is an experienced consultant with a proven track record of helping businesses achieve procurement excellence and navigate complex contractual landscapes.

- Key drivers: Incentives, subsidies and opportunity mindset
- Key constraints: Regulatory complexity

6.3.6 Summary of Participant's Voice

Table 28 is a summary of the participant's voice identifying the relationships between individual and social structures (Stones and Jack, 2016). Intention by business owners about sustainability appears to be influenced by several key factors. First, and principally, internal structures such as leadership and vision play a crucial role, and consequent actions including strategic integration and executive commitment are essential. Anticipated outcomes of those actions in terms of economic benefits, including efficiency gains and cost savings, drive intentions.

Second, actual behavioural uptake of sustainability practices, however, appears to depend heavily on external structures such as perceived feasibility, resource availability and skill set of the business owner. Moreover, participants identify the regulatory and policy environment, including compliance and supportive legislation, as being impactful on sustainability efforts. Related to external structures, stakeholder engagement via collaborative arrangements and customer demands for environmentally friendly or ‘green’ products and services are identified as important, while innovation, generally associated with (affordable) technological advancements, is flagged as necessary to support greater sustainability uptake.

Table 28. Participant's Voice (Interviews)

Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Sustainability actions are driven by cost savings rather than environmental concern	Emphasised simplicity and tangible benefits to ensure successful implementation	A pragmatic and cost-focused perspective	Aims to lower costs and improve service delivery	Has witnessed a significant shift towards sustainability
Costs are the overriding factor (core metric of outcomes of actions)	Integrating sustainability into business practices (action)	Technical acumen and strategic insight (internal structures)	Advocates local sourcing of components and building reliable, strategic relationships (collaboration)	Large corporations are often driven by regulatory requirements and CSR mandates (SMEs are not) (external structures)
Sceptical about competitors' sustainability efforts (actions)	Identify initiatives that can provide tangible benefits (outcome of actions)	Need to see a clear financial benefit or a shift in market demand (outcome / external structure)	Is passionate about sustainability (internal structure - mindset)	SMEs adopt sustainable practices, motivated by the personal values of their founders and employees
Highlighted the absence of governmental or industry mandates for sustainability reporting (external structures)	Business strategy needed (internal structure)	The current understanding of sustainability is limited (internal structure – knowledge)	Sustainability can be environmentally beneficial and economically advantageous (internal belief and outcomes)	Incentivizing sustainability through simplified tax credits (external structures)
Quote: "...profitability remains paramount"	Quote: "... Need a practical and strategic approach to sustainability	Quote: "...easier to incorporate sustainability from the outset as a core value, rather than retrofit"	Quote: Integrate sustainable practices into business operations	Quote: "SMEs are typically motivated by the personal values of their founders and employees".
Entrepreneurial Opportunity Orientation				
- Survival	- Opportunity	- Opportunity	- Opportunity (growth)	- Opportunity

6.4 Open-Ended Survey Data

Table 29 is a summary of responses to perceived challenges to uptake by SMEs from the open-ended survey data. The most significant challenges are internal structure-related concerns, such as cost, representing 45.2% of responses, which includes financial barriers like implementation costs, disruption to business, and customer reluctance to pay higher prices (Abbasi and Nilsson, 2012; Dey, Chrysovalantis Malesios, *et al.*, 2022). Another internal challenge is the time constraints that comprised 23.8% of the responses. Business owners having limited time is a theme that is consistent with the literature (Caldera, Desha and Dawes, 2019; Ernst *et al.*, 2022). Access or availability of resources is 12 %, while Knowledge and (required) expertise make up 19%, indicating the need for a specialised skillset and understanding of the advantages associated with sustainability practices (Ghadge *et al.*, 2017; Suriyankietkaew, Krittayarangroj and Iamsawan, 2022). Finally, building infrastructure-related challenges accounted for 12% of responses (disrupting business activity), while technology-related challenges (7%) and stakeholder pressure (5%) were noted as impacting the uptake of sustainability practices by SMEs.

Table 29. Summary of Open-ended (Survey) Responses

Priority	Challenges	Participant Voices
1	High Cost (45.2%) (internal structure)	“...cost of implementation” “...in installation and disruption to business activities.” “Initial finance” “Upgrading our products to be more eco-friendly will increase the cost of our services and a lot of customers do not want to pay.”
2	Time Constraints (23.8%) (internal structure)	“Time Consuming” “Finding time to work on the sustainability area.”
3	Availability of Resources (12%) (internal structure)	“Hard to find companies to source paper” “Supply chain and retail unit restrictions” We need technologies that are not expensive.” “Do not have enough resources or staff at our disposal”
4	Knowledge & Expertise (19%) (internal structure)	“Knowledge around the legislation and standards”

		<p>“We don’t know where to begin our green journey from”</p> <p>“No one trained in this area, so we lack knowledge”</p>
5	Infrastructure (12%) (external structure)	<p>“It’s a very old building, we need permissions”</p> <p>“Our customers are pushing us to be more sustainable, but we do not have the (supply chain) infrastructure.”</p>

6.5 Business Cases

Figure 24 identifies five (5) major themes and primary challenges to successful sustainability uptake highlighted by a summary review of the (30) business cases. These themes include information and skills (83%), costs (81%), infrastructure (73%), time (70%), and governance, which includes awareness or expectations of government support (65%). The results suggest that while there is potential for broad uptake, significant internal structural barriers exist, particularly related to Costs and requisite Information/knowledge, while governance is the primary external structural challenge.

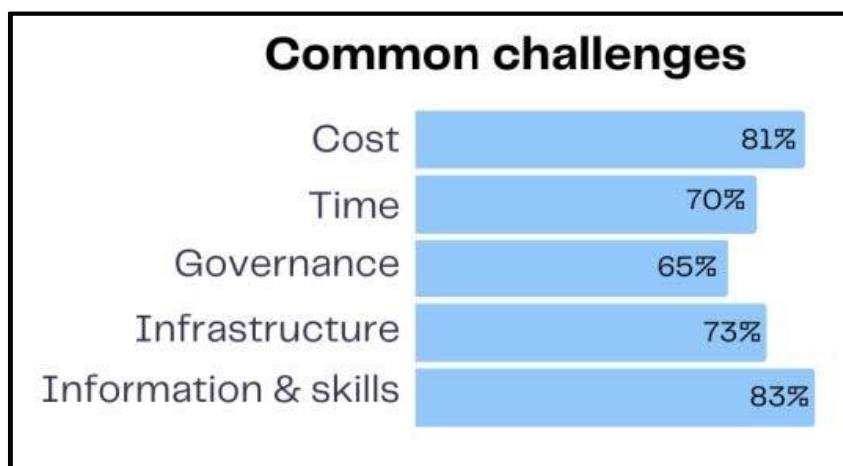


Figure 24. Common Challenges in Sustainability Uptake

Most SMEs express a growing awareness of the need to adopt sustainability, but there is a seeming lack of awareness of how to begin their sustainability journey. This assessment is based on the lack of information (internal structures) and associated knowledge on how to instal technologies such as solar panels, energy management systems and building insulation. The challenges are further compounded by concerns over cost implications, in particular when transitioning to sustainability (time and costs

incurred in reduced business activity), both aspects being long-standing worries as evidenced by literature (see Parker, Redmond and Simpson, 2009) on costs, and (Revell, Stokes and Chen, 2010) on a lack of reliable information and a trusted vendor. Attitudinally, the focus of business owners is categorised as largely internally directed, short-term (cost / profit) and displaying a general discomfort with risk and change (Ion, 2020). As a consequence, openness to entrepreneurial opportunity was limited, but a few business owners were more open to opportunity and generally proactive.

6.6 Summary of Qualitative Data

Table 30 is a summary of the entire qualitative data set from the three sources – interviews, open-ended questions and secondary data (business reports). The information was used to generate a thematic second-order map and six aggregate dimensions that served as the building blocks for grounded models in further analysis. Data was organised across four main dimensions: external and strategic (long term) factors, and internal and operational (more short-term) factors.

Table 30. Summary of Qualitative Data

Priority Theme	Participant (Interview) Voice	Survey (open-ended questions)	Secondary Data (Business Reports)
External/ Strategic			
Regulatory pressure	"Regulations are cumbersome and stifle entrepreneurship." - Opportunity to differentiate	"We comply with regulations, but they feel more like a burden than a benefit."	There is increased regulatory pressure, especially for larger firms.
Tax Grants/ Subsidies	"Tax benefits or incentives would drive change."	"Government grants can make sustainability more accessible for small businesses."	Subsidies significantly impact the adoption of green technologies.
Green Finance	If we had access to low-interest loans or green finance, we could invest more...."	"Financial institutions should offer better green finance options for SMEs."	Green finance adoption is growing, but access remains limited for small firms.
Customer Expectations	"Our customers are starting to expect more sustainable practices from us."	We've seen a shift in customer demand towards greener products	Growing consumer preference for eco-friendly brands.
Internal / Operational			

Cost/ROI	Sustainability investments need to show clear ROI for us	"Cost-effectiveness remains the top priority."	ROI is the primary consideration for sustainability investments.
Knowledge/ Expertise	"We lack the in-house expertise to implement complex sustainability initiatives."	"Need for more knowledge and guidance on sustainable practices."	Skills gap in sustainability knowledge among SMEs.
Change/ risk aversion Mindset	"We're hesitant to invest - technology changes too fast."	"There's a fear of investing in green tech only for it to become obsolete."	Risk aversion due to uncertainty in green tech performance is a common theme
Entrepreneurial opportunity	From opportunity seeking to No change. "Profit is the focus, sustainability is secondary, unless it fits with strategy"	"Adopting sustainability is more about the mindset of leadership." Opportunity (growth)	Leadership vision is critical for sustainability (Prosocial Opportunity)
Practices (SMEs)			
	Participant (Interview) Voice	Survey (open-ended questions)	Secondary Data (Business Reports)
High Impact (Strategic & Scalable)	Circular Economy Supply Chain Recycling	Smart Tech Digital Invoices	Solar panels Sustainability Audits Waste management Renewable Energy
Lower Impact (more cost oriented)	Green Marketing Remote work Carbon Neutral Certification	Carbon Offsetting EVs	Green roof Smart grid dashboard

6.7 RQ2: Structural & Environmental Interdependencies

Knowing structure reliably influences behaviour (Van Lange et al., 2015), RQ2 seeks to extend understanding of structural and environmental interdependencies in order to activate the collective potential of small businesses as environmental agents that research suggests could be powerful (Smith et al., 2022). We turn now to examine

structural and environmental interdependencies impacting the uptake of sustainability practices, using the three-steps in the Gioia methodology as shown in Table 31.

- RO4: What are actor vs environmental characteristics that influence the behaviour of Irish SME owners in relation to sustainability practices?
- RO5: What are the opportunities for Irish SMEs in relation to sustainability uptake?

Analysis began with data familiarization and transcription. Transcripts were read multiple times to thoroughly understand the data. Notes were made both on paper and in NVivo using memo and annotation features. The analysis onwards in relation to RO4 and RO5 is based on the three steps in the Gioia methodology (Gioia, Corley and Hamilton, 2013b; Magnani and Gioia, 2023).

- The first step, data familiarisation and initial coding, was done using NVivo (see Figure 25).
- In the second step, initial codes are refined, merged or split to generate a set of categories that best represented the data. The aim is to distil the range of first-order codes into a manageable and meaningful second-order structure that provided theory-based insights into RQ2 and ROs (Gioia, Corley and Hamilton, 2013b; Magnani and Gioia, 2023).
- The third step involves transforming the themes into aggregate dimensions that serve as the building blocks for grounded models (Gioia and Pitre, 1990; Corley and Gioia, 2011). Once the grounded model(s) were established, the next task is to create a data structure or visual model that illustrates the progression from first-order codes to second-order themes and finally the aggregate dimensions.

Table 31. *Qualitative Methodology*

Phase	Description of the Process	NVivo	Strategic Objective	Iterative Process	Gioia Method	
1. Familiarisation with the Data	Transcribing data (if necessary) reading and re-reading the data, noting down ideas.	Data import and review	Develop a deep understanding of the data	Re-reading and note-taking	Immersive review and context setting using literature.	Step 1
2. Systematic Data Coding	Coding interesting features of the data systematically across the entire data set, collating data relevant to each code.	Node creation and coding	Identify key data and segments and ensure comprehensive coverage of the data	Iterative coding refinement	Systematic tagging of data points, incorporating contextual and environmental factors to enrich coding.	
3. Generating Initial Themes	Collating codes into potential themes, gathering all data relevant to each potential theme.	Theme node creation	Organize coded data into coherent themes	Grouping and categorization of codes	Synthesis of coded data into broader themes, integrating diverse data layers and contextual insights.	Step 2
4. Developing and Reviewing Potential Themes	Checking if the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic ‘map’ of the analysis.	Theme refinement and naming	Clarify and precisely define themes to articulate the story told by the data.	Detailed theme description and adjustment.	Detailed refinement of themes, incorporating comprehensive context and ensuring clarity in definitions.	
5. Developing Grounded Models & 6. Producing the Report	The final opportunity for analysis. Selection of vivid compelling extract examples, final analysis of selected extracts, relating to the research question and literature, producing a scholarly report of analysis.	Report generation	Synthesize analysis into a coherent, scholarly narrative.	Compilation of report and final review	Integration of findings into a comprehensive report, highlighting key insights and contextual relevance.	Step 3

6.7.1 Step 1: Data Familiarisation and Coding

Figure 25 is a visual image created in NVivo to organise the key parent and subordinate child nodes in relation to sustainability practices in SMEs in Ireland, from the business owner's perspective. Initially, raw transcripts were re-read, and interesting and relevant segments were assigned meaningful titles or codes. Coding is the use of a short word or phrase to summarise a portion of textual or visual data (Creswell, 2014). It is a crucial element of qualitative analysis (Braun and Clarke, 2006). Five broad nodes were identified in the data familiarisation phase (Castleberry and Nolen, 2018). These nodes or thematic categories are identified not merely on quantifiable measures, but with due consideration also given to the relevance of the themes to the overarching research question (Bansal and Corley, 2011).

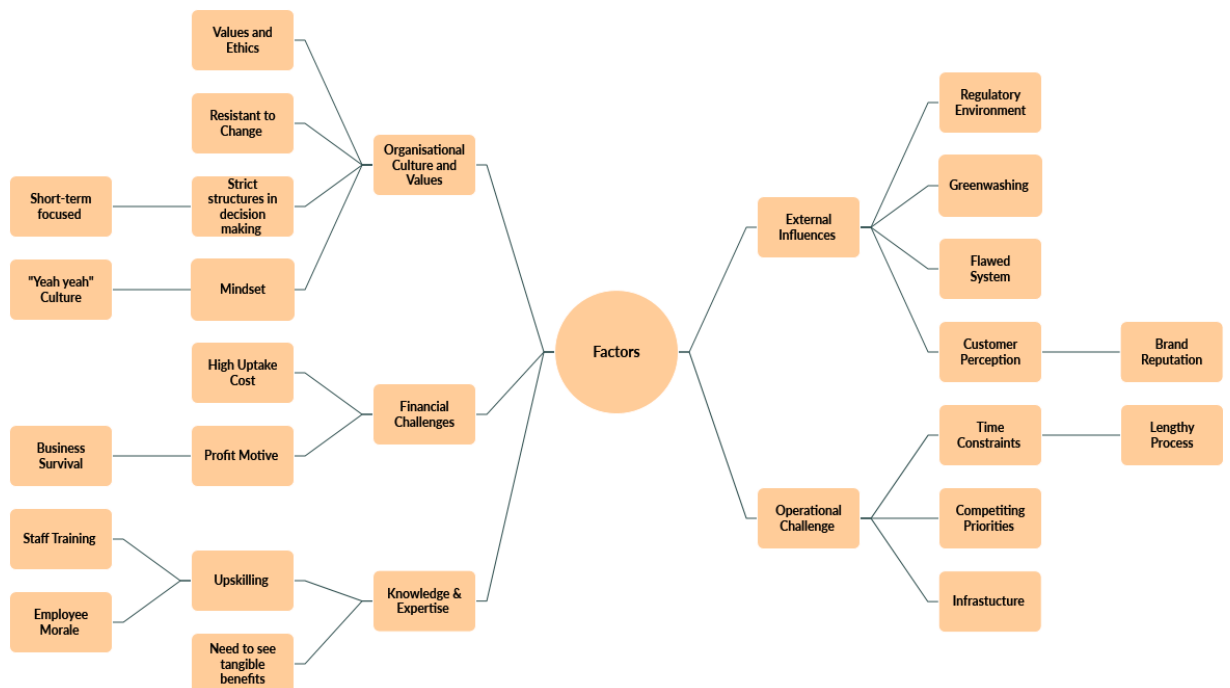


Figure 25. Mind Map Using NVivo

These five initial nodes were rearranged and the data is reviewed once more using the three social capital constructs of structural, relational and cognitive domains (Dubos, 2017). The Structural domain includes external considerations customer and supplier demand and government regulatory policies, as well as internal considerations such as time and cost, funding availability, economic viability and potential effects on the efficiency and strategic alignment of small businesses. The Relational domain is

concerned with the nature of interactions and relationships between people. It includes the influence of both external and internal influences in social roles, power dynamics, and impersonal connections (Lord, Gatti and Chui, 2016). The third Cognitive domain concerns how individuals perceive and interpret their experiences. It includes beliefs, attitudes, values, and thought patterns that shape decision-making and behaviour (Lord, Gatti and Chui, 2016).

6.7.1.1 Regulatory pressure

Greenwashing, a particular external issue noted in Fig 25 is arguably better discussed in conjunction with policy-related decoupling – (see Graafland & Smit 2019), which refers to a gap between policy and practice. This is qualitatively different to greenwashing which is concerned with overstating or falsely claiming good CSR practice or in this case ‘environmental’ credentials. Greenwashing is an implicit consequence of the uncertainty noted in the regulatory environment by participants.

Noting the common concerns with regulatory pressures in the data, it’s worth noting that based on a study of SMEs in Europe and the US (Tyler *et al.*, 2024), the benefits of sustainability practices can vary widely but are positively influenced by (prosocial) manager attitudes, as well as community and customer pressure, while competitor pressure is negatively correlated with adoption. Importantly, in the context of regulatory pressures, as the study by Tyler *et al.* (2024) highlights, proactive orientation to adoption gets stronger as regulatory pressure gets stronger. Moreover, in terms of strategic orientation and management values, Jansson *et al.* (2017) says proactive managers will go looking for future-oriented differentiation by marketing and branding. Alternatively, when faced with weak regulatory pressure, proactively oriented SMEs will find many opportunities unrelated to environmental practices.

Regulatory hurdles and government policies are well examined in varying contexts, and they play a key role in the uptake of sustainability practices, albeit the focus is on regulations that can hinder entrepreneurial spirit (Ratten and Usmanij, 2020; WEF, 2023; Gyamfi *et al.*, 2024). Even so, as the WEF (2023) report that focuses on a data-driven global environment highlights, proactive data governance and resilient IT infrastructure are needed to support cross-border data flows and to track sustainability data supporting environmental responsibility. Moreover, as Gyamfi *et*

al. (2024) shows in an EU-based study, non-financial support termed ‘framework conditions,’ are significant as they affect collaborations and have an indirect significant effect on innovation. Aligning with this view, Participant 4 stated:

“.... Possibly through demands by customers and as well as possible changes from a government policy perspective and here in Ireland and elsewhere that those businesses are now seeing why they need to look at the green agenda. Like I think there needs to be a further considered approach and an accelerated approach by at least government agencies as the leaders and to really encourage organisations to make the change.” (P4)

Likewise, Participant 5 suggested:

“I just think it’s overly cumbersome and it’s all regulation based. It’s going to impair any sort of entrepreneurial spirit we have in Ireland because it’s going to be another thing that we have to do.” (P5)

These examples identify a paradox: government policies can incentivize sustainability, but overly stringent or complex regulations stifle innovation and burden SMEs. A balanced approach that simplifies compliance, while encouraging sustainability seems essential for fostering SMEs. Conversely, implementation may result in box-ticking exercises that do not reflect genuine sustainability efforts. Participant 5 voiced:

“As a business owner sometimes, I need to do a tender process, where I have to fill out all these templates. My belief is that it’s just a box-ticking exercise for big organisations and there is an element of greenwashing going on.” (P5)

These examples collectively suggest regulatory policies play an important role in sustainability uptake, and that regulatory processes are better handled by large corporations. As well, it may inhibit SMEs if regulations impose unnecessary burdens on these businesses and so lead to box-ticking or greenwashing. Conversely, highlighting agency, literature on market-driven behaviour also notes suggests that opportunity-seeking, proactive managers will go beyond compliance to shape market demand (Schindehutte, Morris and Kocak, 2008), particularly relative to peers subject to the same regulatory pressure (Banerjee, Iyer and Kashyap, 2003).

Supplier relations and supply chain management are another important determinant in sustainability uptake. The data reveals collaboration with suppliers and sustainable supply chain practices significantly impact the overall approach to sustainability by some SMEs. Participant 1 said: *“Working closely with our suppliers has been key to our sustainability efforts. By choosing partners who share our values, we can ensure that our entire supply chain operates responsibly.”* (P1). Additionally, Participant 3 said: *One of the biggest challenges is ensuring that our suppliers meet our sustainability standards. It’s not always easy to find partners who are willing or able to make the necessary changes.”* (P3)

The availability of sustainable materials and the reliability of suppliers are critical factors for SMEs. According to Lee (2008), strong relationships with suppliers are essential for the successful implementation of sustainability practices. However, changing suppliers can introduce risks such as supply chain disruptions and increased costs, making SMEs hesitant to switch without assurance of stability and reliability.

“We want to use more sustainable materials, but our suppliers don’t offer them. Switching suppliers is risky and could disrupt our operations.” (P4)

Additionally, “We’ve tried to negotiate with our suppliers for greener options, but they aren’t responsive. It’s frustrating because we’re committed to sustainability, but we need their cooperation to move forward.” (P4)

6.7.1.2 Financial structures

Financial structures can promote sustainability. The issue is highlighted in several studies (Govindan *et al.*, 2014; López-Pérez, Melero and Javier Sese, 2017). According to Bellucci, Pennacchio and Zazzaro (2019), government policies that provide financial incentives, such as tax breaks or grants, are crucial in encouraging SMEs to adopt sustainability practices. Similarly, government support in the form of tax benefits and subsidies, can help alleviate cost concerns and encourage the adoption of sustainable practices. The experience of participants is evident.

“If there were more tax benefits for investing in green technology, it would be much easier for us to justify the costs. Right now, the financial burden is too heavy.” (P1)

"Subsidies for renewable energy installations would really help us make the switch. Without financial support, it's hard to take that leap." (P2)

Tax benefits can similarly significantly reduce the financial burden of investing in sustainable technologies for SMEs. According to Simpson, Taylor, and Barker (2004), government tax incentives lower cost barriers and make sustainability investments more attractive and feasible for small businesses. These incentives will help SMEs offset initial investment costs and achieve long-term financial and environmental benefits. Subsidies are another effective tool for encouraging SMEs to adopt sustainable practices. As noted by Revell, Stokes and Chen (2010), financial support in the form of subsidies can reduce the upfront costs of renewable energy installations and other sustainable technologies, making them more accessible to SMEs and helping bridge the gap between intention and action.

According to Cecere, Corrocher and Mancusi (2020), financial constraints are a significant barrier to the adoption of environmental practices among SMEs. Grants can help small businesses overcome these financial barriers and invest in sustainable technologies and practices, while dedicated funds, as highlighted by Horváthová (2010), can provide the financial backing needed by SMEs to implement renewable energy solutions and other green technologies.

"Access to grants for sustainability projects would be a game-changer for us. We want to go green, but we just don't have the extra funds to invest in these initiatives." (P4)

"Securing funds dedicated to renewable energy installations would allow us to make significant changes without worrying about the financial impact. It's the push we need to start our sustainability journey." (P5)

6.7.1.3 Infrastructure

Infrastructure considerations include affording costly technology and related sustainability practices, as well as capacity and skills limitations to training and the practical inability to adapt rented properties. These internal structural issues can pose substantial barriers to the adoption of sustainable technologies.

"We rent our building, and our landlord isn't interested in making any sustainability upgrades. It's frustrating because we can't make the changes ourselves." (P3)

"Even though we want to install energy-efficient systems and solar panels, we can't get the necessary permissions from our landlord. It's holding us back from going green." (P5)

SMEs that rent their premises are frequently restricted in their ability to make infrastructural changes, limiting their opportunities to adopt sustainable technologies. Landlords often have little incentive to approve or invest in sustainability improvements, especially if they do not directly benefit from reduced operating costs. This situation underscores the importance of creating incentives for landlords to support sustainability initiatives in rented properties. Additionally, SMEs that are located in older buildings with inefficient systems, and without the authority to make upgrades, they are forced to operate under less sustainable conditions.

Participants report time constraints pose a significant challenge for SMEs in adopting sustainability practices. This is consistent with the literature on SMEs (Caldera, Desha and Dawes, 2019; Madrid-Guijarro and Duréndez, 2024). Participant 3 noted: *"Time is one thing we never have enough of, especially when it comes to something as involved as sustainability."* While, Participant 2 says: *"We barely have time to manage our day-to-day operations, let alone think about long-term sustainability goals."*(P3)

High costs are another issue reported when implementing sustainability measures. Costs can be a significant barrier for small businesses. Participant 1 noted: *"I wish that we were in a position to make sustainable choices. Yeah, but when you run a small business cost is the only thing and maintaining a spongy profit margin. That's literally the only thing that matters."* P2 remarks: *"I would love to do it, but the cost needs to come down to sustainability for me to make the transition."* P3 says: *"As a small business owner, my eyes are always on the profit. I need something that is cost-effective,"* and P4 adds: *"I am a startup business and the thing about it is that when you are a start-up business, the cost is something you need to be focused on because it literally grips you like a vice."* (P4)

6.7.1.4 Profit focus

A related issue to costs is the priority given to an immediacy of sustainability outcomes and the imperative of short-term profits (Andrieş *et al.*, 2018; Durrani *et al.*, 2024). Consistent with this literature, the prevalent theme in the data is the (immediate) profit focus that overshadows the potential long-term benefits of sustainability. Participant 3 emphasised: *“As a small business owner, my eyes are always on the profit. I need something that is cost-effective.”* Participant 1 says: *“...maintaining a spongy profit margin, that’s the only thing that matters.” (P1)*

The dominance of short-term profit motives over long-term sustainability benefits is consistent with the literature. Johnson and Schaltegger (2016) suggests that SMEs prioritise immediate financial performance over environmental concerns due to the pressure of maintaining profitability and business survival. This short-term focus can lead to the underestimation of long-term gains from sustainable practices, such as cost savings and improved efficiency (Ortiz-de-Mandojana and Bansal, 2016; Wu *et al.*, 2017).

6.7.1.5 Capacity & Knowledge Gap

Capacity and knowledge gaps regarding sustainability practices and their benefits can impact the adoption. The following quotes from business owners highlight the knowledge gaps they see, with each quote supported by literature to emphasise their pervasive impact.

“We want to adopt green practices, but we don’t have enough information on how to implement them effectively. It’s overwhelming trying to figure out where to start.” (P4)

Studies have noted SMEs often report insufficient knowledge and guidance on how to integrate environmental practices into their operations (Journault, Perron and Vallières, 2021; Ernst *et al.*, 2022). Providing detailed, actionable information and supporting resources helps bridge a knowledge gap and facilitate the adoption of sustainable practices. As noted by Testa *et al.* (2011), SMEs often struggle with evaluating the economic benefits and costs associated with sustainable practices due to limited expertise and access to relevant data. Bridging this knowledge gap requires

capability in terms of tools and support for SMEs to assess and understand the financial implications of sustainability initiatives.

"We know regulations are changing, but we're not fully informed about what new compliance requirements are coming and how to prepare for them."(P1)

Staying up-to-date with changing regulations and compliance requirements is a common challenge for SMEs. Zhu and Sarkis (2004) reported SMEs often face difficulties due to a lack of up-to-date information and expertise. Dey, Chrysovalantis Malesios, et al. (2022) also pointed out that these SMEs lack the knowledge or the know-how to implement sustainability practices in their businesses. The data also highlights the need for targeted upskilling and the role of expert guidance in fostering sustainability within these organisations. Participant 1, emphasised the necessity of providing expertise alongside financial support:

"I think we need to foster some knowledge and get expertise alongside with financial support. Yes, experts, people who can actually turn around and say to you, 'OK, I'll spend a couple of hours with you each week and help you build your sustainability.'"(P1)

The quote highlights the importance of expert guidance in addition to financial resources. SMEs often require hands-on support to navigate the complexities of sustainability practices. SMEs often struggle and access high-quality training programs due to limited resources and time constraints (Kraus *et al.*, 2022; Madrid-Guijarro and Duréndez, 2024) This gap in skills and knowledge can significantly impede their ability to implement sustainable practices effectively. Wilson (2018) suggests that developing internal capabilities through targeted upskilling and training programs is crucial for sustainable development in SMEs. This approach not only enhances the skills of the workforce but also fosters a culture of continuous improvement and innovation. Conversely, a reliance on external expertise is fraught with uncertainties, as the quality and relevance of outsourced services may vary (Mühlböck *et al.*, 2018).

6.7.1.6 Employee Upskilling

All participants commonly highlight the importance of upskilling employees, and the challenges associated with finding skilled personnel or outsourcing expertise. Participant 2 emphasised:

“We need to upskill more and more people because I don’t think it’s necessarily a factor that people don’t want to do a good job.” (P2)

This statement reflects a recognition that employees are generally motivated to perform well, but often lack the necessary skills to implement sustainability practices effectively. The challenge, therefore, lies in providing adequate training and development opportunities. Participant 3 reinforced this sentiment, saying:

“The people are hopefully inherently good and want to do a good job, and it’s more so that there just isn’t people out there... there isn’t the skill set there yet.” (P3)

The scarcity of skilled personnel presents a significant barrier to sustainability uptake. Even with a motivated workforce, the absence of specific skills and expertise can hinder progress. This gap necessitates targeted training programs to build the required competencies. There are also difficulties with outsourcing sustainability expertise:

“Finding people to outsource is also difficult because you never know what kind of work the outsourcing company would do for you.” (P4)

“...Yes, I’m talking about experts, people who can actually say to you, ‘OK, I’ll spend a couple of hours with you each week and I’ll help you build your sustainability.’ (P5)

This last response illustrates the need for reliable and accessible expertise that can provide hands-on practical guidance to SMEs. The literature supports these findings, emphasizing the critical role of employee training and achieving sustainability goals (Markman *et al.*, 2016; Bischoff, Gielnik and Frese, 2020). Training and development programs are essential for equipping employees with the skills and knowledge needed to drive sustainability initiatives (Kraus *et al.*, 2020). However, SMEs often face challenges in accessing and affording high-quality training

programs. Moreover, the reliance on external expertise can be fraught with uncertainties, the quality and relevance of outsourced services may vary, and it may cost a lot of money and time for business owners. Thus, as Participant 3 says: *“Outsourcing sounds good, but it’s a gamble—you never know if you’re getting your money’s worth.” (P3)*

6.7.1.7 Strategic Alignment

A final infrastructure challenge noted is the necessary strategic alignment between business goals and sustainability initiatives. Participants recognise this is crucial for the successful adoption. *"We understand the importance of sustainability, but it's hard to see how it fits into our current business strategy without diverting resources from our core activities."(P1)* *"We want to be more sustainable, but our current business plan is heavily focused on short-term goals. Shifting to long-term sustainability strategies requires a significant change in our strategic approach." (P4)*

According to Epstein and Roy (2001), aligning sustainability initiatives with overall business strategy can enhance long-term performance and competitive advantage. However, many SMEs struggle to see how sustainability fits within their existing strategic frameworks, making it crucial to provide guidance and resources to help them integrate these practices seamlessly.

Table 32. Summary Themes (Structural Domain)

Situational Domain			
Main Theme	Sub Theme	Files	References
Government & Regulatory Supplier relations Investor pressure Stakeholders State policy	Government support	21	33
	Grants & Funds	13	16
	Regulatory environment	18	25
	Supplier relations	6	8
	Investor pressure	10	16
	Stakeholder expectations	7	10
	Decoupling		
Financial	Time & Costs	29	81
	Financial Aids	15	29
	Economic Viability Concerns	15	19
	Investment Discrepancies	18	31
	Profit Motive	21	46
Infrastructure	Infrastructure	15	26
	Lengthy Process	13	16

	Operational Efficiency	9	11
	Strategic Alignment	6	11

In summary, *“implementing sustainable practices requires time which we just don’t have.” It’s a juggling act. We want to be sustainable, but there’s never enough time to do it all.*” Time constraints are one of the most challenging barriers when it comes to implementing or transitioning the business to be more sustainable. The Sustainable Energy Authority of Ireland’s (SEAI) retrofit program is a classic example of a less-than-ideal experience with government programs in relation to time.

“I’ve experienced the retrofit one-stop-shop program....and my experience of the program....is that you spend more time chasing the ground, doing presentations, convincing people, all of this.” (P1)

The time-intensive nature of sustainability programs highlights the need to help SME overcome time delays. One approach is to simplify and streamline the processes. Participant 2: *“It needs to be as simple and as easy as possible for businesses to make the change.”* Participant 3 adds: *“It would be nice to have a support network or a point person responsible for sustainability efforts. It helps to have someone focused on these initiatives so it doesn’t get lost in the daily shuffle.” (P3)*

6.7.1.8 Relational Domain

Key sub-themes in the relational domain involve external and internal relationships concerning the nature of interactions and relationships between people. These relationships include the influence of social roles, power dynamics, and impersonal connections (Lord, Gatti and Chui, 2016) - see Table 32. The two key areas highlighted by frequency of mentions: are concerns over customer perceptions (external relations) and a composite concern with employees (internal relations).

Table 33. Summary Themes (Relational Domain)

Relational Domain			
Main Theme	Sub Theme	Files	References
External Relations	Brand Reputation	7	11
	Customer Perception	19	34
	Networks	14	28
Internal Relations	Employee Training	19	29

	Organisational Culture	11	18
	Employee Morale	16	23
	Employee Engagement	13	23

External Relations

The data reveals a recognition that a strong, positive reputation can drive the uptake of sustainable practices, as it helps to secure the long-term viability and success of the brand. Participant 1 emphasised the critical role of reputation in business sustainability: *"My brand reputation is very important, so it is like all ultimately the thing that survives is the brand. People leave companies and companies come and go, but the brand remains. So, reputation is absolutely central to that."* (P1)

The comment by P1 highlights the idea that employees may come and go, and even companies may face existential challenges, but the brand's reputation endures and so is vital for long-term success (López-Pérez, Melero and Javier Sese, 2017; Baah *et al.*, 2021). For SMEs, maintaining a positive reputation can be a compelling reason to adopt sustainable practices. The importance of reputation in driving sustainability is well-documented. For instance, Dressler and Paunovic (2021) argued that firms with a strong reputation are more likely to engage in sustainable practices because they are under greater scrutiny from stakeholders and must maintain high standards to protect their image. This is particularly true for SMEs that rely on local communities and word-of-mouth for their customer base (Gaganis, Pasiouras and Voulgari, 2019; Cowan and Guzman, 2020). Furthermore, a strong reputation for sustainability can lead to tangible business benefits. Research by Tiep Le, Ngo and Aureliano-Silva (2023) indicated that companies recognized for their environmental efforts enjoy enhanced customer loyalty and can command higher prices for their products or services.

A related consideration is customer perception which is seen to play a crucial role in driving adoption among small and medium-sized enterprises (SMEs). The data suggest that meeting customer expectations for sustainability can significantly influence business strategies and operations. Participant 1 stated:

"We need to build our proposition such that your audience, your target market, your target audience will want to engage with your proposition." (P1)

This perspective emphasises the need for SMEs to understand and cater to the sustainability preferences of their target market to remain competitive and appealing. Participant 2, illustrates an opportunistic approach to sustainability driven by customer expectations: *"I don't really care about sustainability, but I do care about my customers and my customers want me to be sustainable."* This statement reflects a common scenario where businesses prioritise sustainability not necessarily out of intrinsic motivation but due to external pressures from customers who value sustainable practices.

Conversely, Participant 4 viewed sustainability as a unique selling point (USP) in customer relationships: *"Because we can talk to our customers we can use it as a unique selling point. So, through the sales process and through our ongoing relationships, we constantly reinforce those end points around sustainability."* (P4)

The influence of customer perception on business practices is well-supported in the literature. According to Lee and Shin (2010), consumers are increasingly aware of environmental issues and prefer to support businesses that demonstrate a commitment to sustainability. This shift in consumer attitudes pressures businesses, especially SMEs, to adopt sustainable practices to maintain market competitiveness. As research by Kotler and Keller (2016) suggests, businesses that communicate their sustainability efforts can enhance their brand image and customer loyalty.

Internal Relations

Employee morale and engagement are identified as very influential internal factors in the relational domain. Participant 1 highlighted the positive impact of employee involvement in sustainability initiatives:

"When employees are involved in sustainability projects, it boosts their morale and sense of ownership. For example, our team was much more engaged when we started a recycling program and saw tangible results of their efforts." (P1)

Furthermore, Participant 5 stated: *"Many of our staff are passionate about environmental issues. When we switched to smart heating tech, they were very happy about it and their work efficiency increased."* Contrary to this, Participant 4 discussed the challenges of implementing sustainable behaviours among employees:

“While we want to engage our employees in sustainability, the additional workload and complexities often lead to frustration. For instance, incorporating new eco-friendly practices required extra training, which sometimes felt like an imposition rather than an opportunity.” (P5)

Similarly, as Participant 2 noted: *“...We’ve implemented several sustainability practices, but if employees don’t see tangible benefits or improvements, their enthusiasm wanes. It’s crucial to demonstrate the positive impact of these initiatives on both the environment and the business.” (P2)*

Employee morale and engagement are significantly influenced by both the integration of sustainability practices and the operational context in which these practices are implemented. On the positive side, involving employees in sustainability initiatives and aligning these practices with their personal values can enhance engagement and job satisfaction (Paillé, Boiral and Chen, 2013; Yuriev *et al.*, 2020b). However, constraints such as additional workload, perceived complexities, and the lack of immediacy of (and visible) impact from sustainability efforts can undermine morale (Yuriev *et al.*, 2020a). To foster high employee engagement in sustainability practices, SMEs must balance the benefits of involvement with support mechanisms that address potential constraints, ensuring that sustainability efforts are perceived as both rewarding and impactful (Kerr, 2006; Felício, Meidutė and Kyvik, 2016).

6.7.1.9 Cognitive Domain

The Cognitive domain concerns how individuals perceive and interpret their experiences. This includes beliefs, attitudes, values, and thought patterns that shape decision-making and behaviour (Lord, Gatti and Chui, 2016). A summary of themes coded as Attitude (& Mindset) and Planning and Capability are shown in Table 33. The key issue is attitude arguably influenced by perceived benefits, and to a lesser degree countervailing tension in terms of moral and ethical concerns, that shape owner agency in terms of adopting environmental practices, while knowledge and skills are identified as the primary internal capability limitations.

Table 34. Summary Themes (Cognitive Domain)

Cognitive Domain			
Main Theme	Sub Theme	Files	References

Attitude & Mindset	Attitude	28	86
	Perceived Benefits	25	67
	Resistant to Change	14	20
	Uncertainty & Risks	8	10
	Ethical & Moral concerns	17	36
Planning and Capability	Knowledge	20	37
	Skills Gap	15	31
	Long Term vs Short Term	17	21
	Priority Issues	12	16

6.7.1.10 Attitude and Mindset

Despite general recognition of sustainability the expectation of immediacy in benefit appear to play a crucial role in the adoption of sustainability practices among SMEs. Factors such as perceived benefits, costs, uncertainty and risk fuel a general resistance to change, while the desire for innovation and ethical and moral considerations reflect entrepreneurial attitudes (Felício, Meidutė and Kyvik, 2016). Participant 3 described the positive benefits of sustainability: *“Sustainability isn’t just about doing the right thing for the environment; it can also drive cost savings and improve efficiency. We’ve seen reductions in energy costs since implementing some green practices.” (P3)*

Described as push (necessity) and pull (opportunity) entrepreneurs (Alvarez and Barney, 2019), personal traits such as opportunity seeking and risk taking, are commonly associated with opportunity-based creative ventures than necessity-based ventures (Lim, Oh and De Clercq, 2016). Participant 4 described: *“Adopting sustainable practices has set us apart from our competitors. Our customers appreciate our commitment to the environment, which has helped us build stronger, more loyal relationships.”* Similarly, another benefit noted by Participant 5 relates to operational efficiencies: *“Sustainability has streamlined our operations. By reducing waste and optimizing resource use, we’ve improved overall efficiency and productivity.” (P5)*

In contrast, consistent with many views in business cases, SME owners don’t see the benefits associated with sustainability. Participant 4 expressed concerns about the financial burden: *“While sustainability is important, the initial costs can be prohibitive for small businesses like ours. It’s hard to justify the expense when we’re already working with tight margins.”* Similarly, Participant 1 raised the uncertainty of returns: *“We’ve invested in sustainable technologies, but the returns have been slower than expected. It’s hard to stay committed when the financial benefits aren’t*

immediately apparent.” He adds: “Introducing new sustainable practices has disrupted our workflow. It’s been a tough adjustment for the team, and we’ve faced some resistance internally because of the changes.” (P1)

As noted in a study of SMEs in Europe and the US (Tyler et al., 2024), the perceived benefits of sustainability practices can vary widely among SMEs but adoption is positively influenced by (prosocial) manager attitudes, while competitor pressure is negatively correlated with adoption. Importantly, as the study by Tyler et al., (2024) highlights, there are external structures and agencies in which proactive orientation by managers gets stronger as regulatory pressure gets stronger, and alternatively, weak regulatory pressure results in proactively oriented SMEs finding opportunities unrelated to environmental practices. Thus, some owners per Tyler et al. (2024) see financial savings and operational efficiencies as opportunities, while some see adoption as a financial burden, with uncertain returns and operational disruptions.

Conversely, ethics and moral concerns appear to play a big part in the responses to sustainability practices by Irish SME owners. This trend is consistent with literature that suggests that ethical considerations are increasingly influencing business decisions, as stakeholders demand more responsible and transparent practices (Zvaríková *et al.*, 2023). Adding insight from a policy perspective, reflecting on SMEs in Southeast Asia Ion (2020) says, the guiding path is somewhat different to larger businesses, but it commonly starts with public policy. Commenting on practice in SE Asia, Ion (2020) suggests public policy is not yet focused on principles of ethics and sustainability, but the outlook is promising given the rising global value-chain investments that bring a fresh perspective to how public policy can be improved.

Participant 5 highlighted the moral imperative: *“For us, it’s not just profit. We have a moral responsibility to minimize our environmental impact. It’s about doing the right thing for everyone.”* This quote reflects a strong ethical stance, emphasizing the responsibility businesses feel towards the environment and future generations. Similarly, Participant 4 remarked: *“Our team believes strongly in sustainability. They set an example by making environmentally conscious decisions, which inspires the rest of the company to follow suit.”* Participant 5 pointed out the alignment with personal values: *“Many of us here value sustainability on a personal level, so it makes sense for our business practices to reflect those values. It’s about integrity and consistency.”*

On the other hand, Participant 1 reports experiencing an ethical conflict: *“We want to be ethical and sustainable, but the reality of running a small business makes it difficult. There are times when financial survival takes precedence; when it comes down to choosing between paying employees’ salaries and implementing a new sustainable initiative, we prioritise our people.”* Continuing, he says: *“...We want to do the right thing for the environment, but we also have to be realistic about our current capabilities and resources.”* Literature highlights prior technology use and competitive pressures having a significant positive relationship with ethical decision-making, as does the level of risk acceptance (Jansson *et al.*, 2017; Polas *et al.*, 2022).

Consistent with the above, concerns over economic viability are a significant reported factor in the uptake of sustainability practices by participants. The rapid pace of technological advancements and the risk of technology becoming redundant is also seen as posing considerable challenges to successful uptake. Sample participant voices from the interviews and business reports follow:

“We’re hesitant to invest in tech because it seems like every year there’s a new version or a better alternative. It’s hard to keep up and justify the expense.”
(BR)

“By the time we save up enough to invest in sustainable technology, something new and better is already out. It’s like chasing a moving target.” (BR)

The rapid pace of technological change can deter SMEs from investing in sustainability technologies as it creates uncertainty and risk for small businesses that may lack the resources to upgrade their systems (see Ullah *et al.* (2021). This hesitation is exacerbated by the fear that current investments may soon become obsolete because of the rapid innovation cycle in the technology sector (Tidd and Bessant (2023).

6.7.1.11 Planning and Capability

Participant 1 emphasised the pressures that makes it hard to think longer term: *“... we have to focus on what’s right in front of us. The bills need to be paid, and we need to keep the lights on. It’s hard to think about long-term when you’re just trying to survive the next month. When you’re just trying to get money out of the business to make your*

own bills, it's hard to think about long-term sustainability. You're focused on the immediate financial pressures.” (P1)

Contrarily, as Participant 5 observes:

“We believe sustainability is an investment in our future. While it might cost more upfront, the long-term gains in terms of cost savings, customer loyalty, and environmental impact are worth it.” (P5)

“...Sustainability is a part of our long-term strategy. We know it will pay off in terms of efficiency and reputation in the marketplace, even if it requires some sacrifices now.” (P5)

Clearly, financial considerations are a high priority for SMEs in sustainability interventions. As Delmas and Montiel (2009) say, this focus can overshadow long-term sustainability goals and negate the potential for operational cost reductions by realigning sustainability efforts. Conversely, as Murphy and Schlegelmilch (2013) identify, SMEs that prioritise strategic goals such as market expansion and sales growth are opportunity seeking, as distinct to necessity (for employment) entrepreneurs, and balancing growth with sustainability requires careful planning and resource allocation (Lim *et al.*, 2024). Participant 1 flags resistance to change:

“We’ve been doing things in a certain way for years, and introducing new, sustainable practices has met with a lot of resistance. People are comfortable with the status quo and wary of changes that might disrupt their workflow.” Adding, *“Our primary goal is to keep the business afloat. Implementing new things often seems like a luxury we can’t afford when survival is at stake.” (P1)*

Similarly, *“There’s always a risk when you try something new. With sustainability, the upfront costs and uncertain returns make it a tough sell. We need more clarity on the benefits before we can fully commit.” (P4)*

Conversely, Participant 2 emphasised the role of innovation in driving innovation. *“Innovation has been a game-changer. By integrating sustainable technologies, we have reduced our environmental impact but also discovered new efficiencies and cost savings”*. In his words, sustainability pushed us to develop new products and services that appeal to eco-conscious customers, thus opening new revenue streams.”

6.7.2 Step 2: Generating and Revising Categories

The qualitative data from all sources (in Table 33 and Table 34) were (re)sorted into two broad drivers of change (Table 35): external (strategic) factors that need to be considered in decision-making and internal (operational) ones that influence decision-making, respectively (Alba, García Álvarez-Coque and Mas-Verdú, 2013; Delgado, 2018). Entrepreneurial actions such as opportunity-seeking managers and future-oriented actions, such as strategy planning, funding support and alignment with industry standards, are framework conditions for uptake of sustainability (Lim et al., 2024). Conversely, weak regulatory pressure in conjunction with risk-averse manager attitudes and knowledge gaps are reported as stifling innovation and moderating subsequent adoption (Tyler et al., 2024).

Table 35. Internal and External Drivers and Constraints

Internal Drivers	External Drivers	Internal Constraints	External Constraints
Strategy Planning <ul style="list-style-type: none"> Promotes long-term success Proactive leaders / managers drive growth Understanding benefits motivates 	Industry Standards <ul style="list-style-type: none"> Ensures competitiveness 	Economic Viability Concerns <ul style="list-style-type: none"> Profitability concerns/risk-taking Budget constraints & time limitations hinder uptake 	Weak regulatory Environment <ul style="list-style-type: none"> External regulatory pressure is absent Necessity (entrepreneurial ecosystem)
Customer Perception <ul style="list-style-type: none"> Internal quality efforts improve perception 	Government Support <ul style="list-style-type: none"> Policies and funding support to aid strategic objectives 	Uncertainty and Risk Averse Attitude <ul style="list-style-type: none"> Reluctance to adopt new methods delays transformation Competing priorities delay 	Community of Practices <ul style="list-style-type: none"> Lack of community collaboration No Customer Expectations
Supplier Relations <ul style="list-style-type: none"> Strong internal processes ensure reliable relationships 	Customer Perception <ul style="list-style-type: none"> External feedback drives improvements 	Infrastructure <ul style="list-style-type: none"> Inadequate infrastructure slows operations Building ownership limits change 	
Brand Reputation <ul style="list-style-type: none"> Commitment to quality and Values 		Necessity entrepreneurs (employment) Capacity and Knowledge Gap <ul style="list-style-type: none"> Internal skills/ knowledge gaps 	
Employee Training <ul style="list-style-type: none"> Enhances capabilities 			
Employee Morale & Engagement <ul style="list-style-type: none"> Boosts productivity 			

Irish SMEs operate in a dynamic environment, and leadership (internal driver), particularly in terms of opportunity-oriented mindsets and strategic planning are key drivers of growth. The ability to plan and align business strategy with sustainability

goals is critical, particularly with the CSRD that will come into effect (European Commission 2024). According to the National Economic and Social Council (2022), strategic planning in SMEs helps anticipate market shifts and realign business operations with sustainability goals. The literature similarly emphasises that businesses with clear strategic plans are more likely to see the benefits of sustainability (Linnenluecke, 2017; Salvador *et al.*, 2023).

For Irish SMEs, understanding the benefits and their alignment with long-term growth objectives should be a significant internal motivator. Customer involvement and perceptions are closely tied to internal quality efforts (McKinsey, 2023). Irish consumers are aware of sustainability needs, and businesses that prioritise quality in their operations tend to improve brand reputation and customer trust (O'Gorman & McTiernan, 2020). Similarly, a commitment to quality and values, reflected in the brand's image, can help differentiate SMEs in a competitive market. Another key capability for successful adoption is employee training and engagement. Jackson and Seo (2010) highlights that well-trained and motivated employees are more likely to innovate and contribute to sustainability goals. Within the context of Irish SMEs, employee engagement is often linked to organisational culture, where a sense of shared purpose drives both business and sustainability objectives.

Despite the presence of internal and external drivers, internal and external 'constraints' limit sustainability practices. Profit and economic viability concerns are among the most significant internal constraints. SMEs typically operate with limited financial resources, making it difficult to justify investments that do not yield immediate returns (Walker and Preuss, 2008; Eggers, 2020a). The Department of Enterprise, Trade and Employment (2021) reported Irish SMEs struggle with balancing sustainability goals against immediate financial pressures, which delay or entirely block the adoption of new practices. Another key internal constraint is risk-averse attitudes in many SMEs. The reluctance to adopt new methods stems from fears of operational disruption, uncertainty on returns, and sticking with familiar practices (Isensee *et al.*, 2020; Kane, 2024).

Internal capacity and knowledge gaps pose a significant challenge to adoption. Many SMEs lack the expertise required to navigate the complexities of sustainability, from understanding regulatory requirements to integrating sustainable practices into

their business models (Revell, Stokes and Chen, 2010). In Ireland, where the SME sector is characterized by a diverse range of industries, the knowledge gap is particularly pronounced in sectors with lower exposure to sustainability standards. As well, consistent with a study of SMEs in Europe and US (Tyler *et al.*, 2024), the perceived benefits of sustainability practices vary widely but uptake is positively influenced by (prosocial) manager attitudes, as well as community and customer pressure, while competitor pressure is negatively correlated with adoption.

The regulatory environment is well recognised and is a critical influence on uptake of sustainability. Tyler *et al.* (2024) notes that strong regulatory pressure reinforces managerial proactive orientation, while weak regulatory pressure can result in opportunity seeking activity away from environmental practices. Consequently, as complex regulatory frameworks are resource-intensive and overwhelming for those with limited access to legal and compliance support (Department of Business, Enterprise and Innovation, 2019), the present weak regulatory environment in Ireland means a significant constraint for SMEs as it can divert opportunity-seeking away from sustainability. Other external factors that impact include weak community collaboration (networks) and limited infrastructure (Salvador *et al.*, 2023). The lack of industry networks means many SMEs miss out on best practices and on peer support (Phillips *et al.*, 2015). One final external constraint is supplier relationships. Internal processes ensure reliability, while external suppliers who do not prioritise sustainability can disrupt the value chain and create inconsistencies in quality and standards (Abbasi and Nilsson, 2012; Ghadge *et al.*, 2017; Darendeli *et al.*, 2022).

6.7.3 Step 3: Generating Aggregate Dimensions

The sustainability landscape for Irish SMEs is shaped by a complex interplay of internal and external factors related to actors and the environment. These factors drive and constrain business owner behaviour in relation to adoption of sustainability practices. Figure 26 shows the progression from first-order codes to second-order themes and to the aggregate dimensions for sustainability uptake by SMEs using the Gioia methodology. Step 1 are first-order concepts based on participant voices, abstracted into second-order themes and then integrated with theory (incorporating change management, competing values, social capital theory and structuration theory) to identify aggregate dimensions (Gioia, Corley and Hamilton, 2013a), high-level

constructs that represent the core theoretical concepts emerging from the data. A total of six aggregate dimensions were identified: two antecedent dimensions and four operational dimensions, as follows:

- Two antecedents:
 - a forward-looking, proactive entrepreneurial outlook (Sarasvathy *et al.*, 2010) characteristic of opportunity-seeking strategy, as distinct to necessity (for employment) businesses (Lim *et al.*, 2024), and
 - entrepreneurial innovation (ecosystem) that is presently characterised by weak social capital – a lack of connections and interactions, uncertain regulatory conditions, and limited collaborative norms (Harima, 2024; Harima, Harima and Freiling, 2024). Given the embeddedness of SMEs in a regional context, ecosystem evolution and sub-set ecosystems are future valuable research area (Brown, Mawson and Rocha, 2023).
- Four aggregate dimensions (and core theoretical concepts) emerge from the data: Infrastructure, Environmental conditions, Agency or owner mindset, and Impact. They complement strategy that is a useful predictor of uptake (Child *et al.*, 2017).

Antecedents are events or conditions that influence the scale and outcome of actions in a social system. The local entrepreneurial ecosystem, characterised by a lack of connections and interactions between actors, is described as a nascent ecosystem dominated by a few influential organisations (Harima 2024a), such as policy makers, universities, and established firms, termed variously as anchor firms, anchor tenants or ecosystem leaders. Scholars agree that such anchor actors can catalyse ecosystem evolution (Goswami, Mitchell and Bhagavatula, 2018; Bhawe and Zahra, 2019; Bichler *et al.*, 2022), and the challenge is to strengthen their role by building collaborative dynamics and ecosystem-level social capital (Harima, Harima and Freiling, 2024). It also involves a good ecosystem governance – the business, legal and technical policies and rules that apply, as clear governance is deemed as indispensable (Cho, Ryan and Buciuni, 2022; Brown, Mawson and Rocha, 2023).

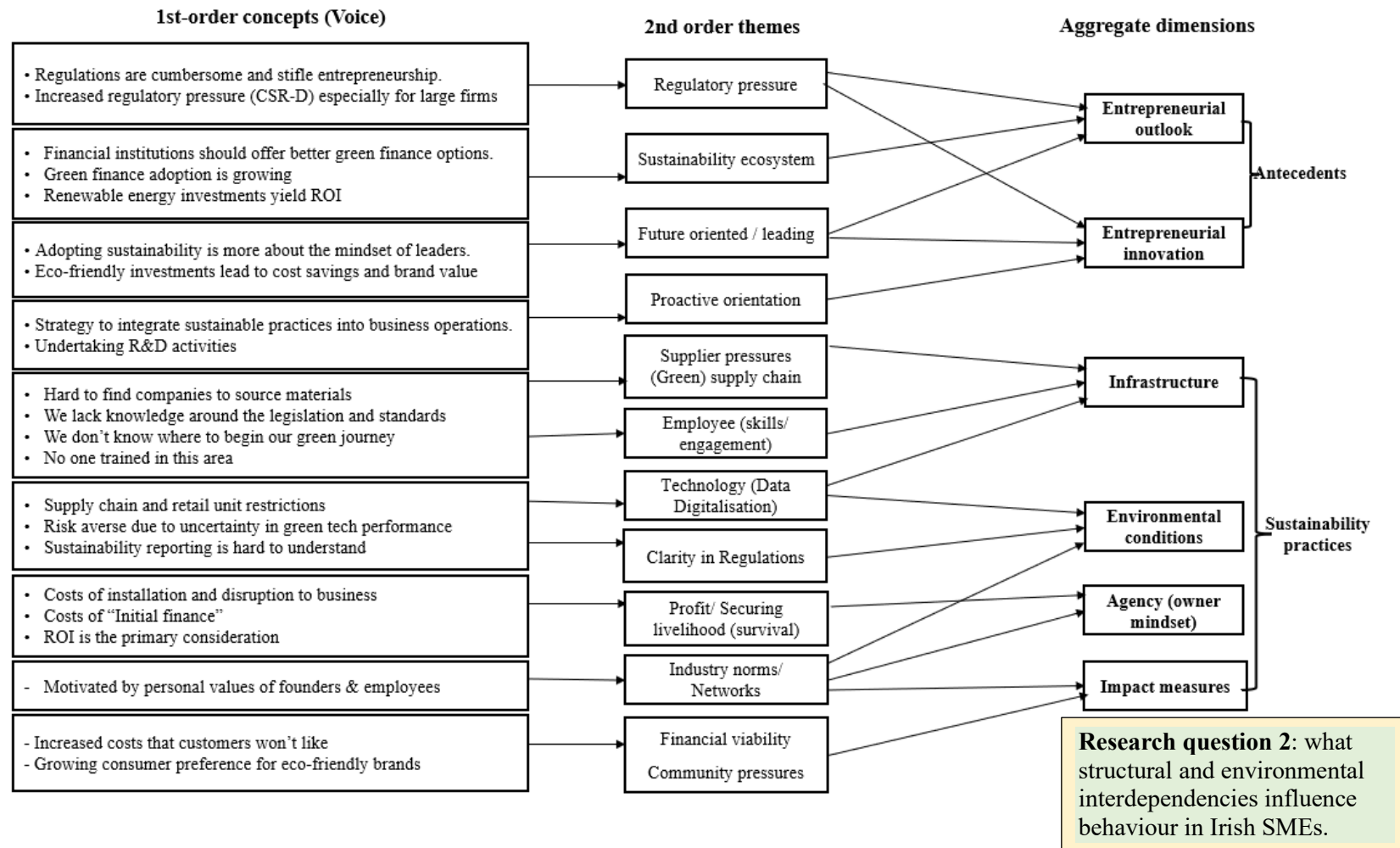


Figure 26. Mapping Participant (Owner) Views: A Gioia-Based Approach

6.8 RQ2: What are the structural and environmental interdependencies impacting sustainability related behaviour

Interdependence theory offers valuable insights into the dynamics in relationships between factors that impact behaviour (Rusbult and Van Lange, 2003). The core principles relevant to structure, processes, and adaptation were summarised in Chapter 2 (see section 2.2.2). As early theorising suggested, threat situations provoke *demand-withdraw* patterns, while situations with uncertain information can cause misunderstanding and ignite reliance on *generalised schema* regarding partners and situation (Thibaut and Kelley, 1959). Table 36 identifies four broad demand-withdraw patterns in the action characteristics noted. To illustrate, drivers include opportunity recognition and actor mindset, while environmental factors like regulatory uncertainty, financial (cost) concerns, and costly infrastructure (technology and supplier pressures) all prompt withdraw type behaviour. The impact of this pattern is evidenced by the concern many SMEs express about profits and business survival.

Theoretically positioned between predictors and outcomes, the aggregate dimensions in Figure 26 identify actions and policies that help address RQ2: *what actor and environmental factors influence sustainability practice behaviour in Irish SMEs*. These factors demonstrably illustrate key aspects of the business model – of how Irish SMEs do business to gain value. A preliminary answer to RQ2 is that the ‘business model’ adopted by the SME appears a key predictor of sustainability uptake. Different to strategy, which is a firm’s positioning given external conditions, a business model concerns value-creating capabilities that include technical, managerial and social capital, and the process adopted – innovation, new capabilities, partnerships, and technology, to realise this value when enacting firm strategy.

Discussed at length in literature (see Teece, 2010; DaSilva and Trkman, 2014; Klang, Wallnöfer and Hacklin, 2014), two distinct business models are noted: a ‘value creation’ model and a revenue generation model, which is concerned with prices and fees (Child *et al.*, 2017). These models are like the focus by Teece (2010) on value proposition, based on the market and customer, and value creation based on processes. Table 36 categorises the combination of actions and capabilities associated with performance by SMEs that broadly align with the models noted in literature.

Table 36. Social Dynamics and Illustrative Business Characteristics

Actions/ Characteristics	Cat 1: Yes (Substitute)	Cat 2: Yes (Innovative)	Cat 3: Yes (But)	Cat 4: No (Because)
Opportunity Recognition (Sarasvathy et al., 2010)	Discovery	Creative	Allocative	Inertia
Mindset (Agency)	Practical/ Efficient/ Follower	Prosocial/ Leading/	Dependent/ Cautious	Follower/ /Self-Interested
Temporal Orientation	Future	Future	Present	Present
Nature of Actor Dependence	Independent	Independent	Reduce Dependence	Reduce Dependence
Structural/ Relational (Capability)	Medium (3)	High (4)	Medium (1)	Low (0)
Regulatory Environment (Weak pressure) *	No	No	No	No
Industry Standards	Yes (-)	Yes (-)	Yes (-)	Yes (-)
Knowledge & Skills	Yes	Yes	Yes	(-)
Employee Training	Yes	Yes (+)	Yes	No
Government Support	Yes	Yes	Yes	Yes (-)
Competing Priorities	No	No	No	Yes
Strategy Planning	Yes	Yes (+)	No	No
* Sustainability regulatory policy lacks enforcement; regulation environment lacks clarity; + and (-) indicate strong or weak expression				
Brand Reputation	Yes	Yes	No	No
Customer Perception	Yes	Yes	Yes	No
Employee Morale & Engagement	Yes	Yes	Yes	No
Community of Practice (Networks)	Yes	Yes	No	No
Supplier Relations	Yes	Yes(+)	Yes	No
Cognitive (Attitude)	Medium (3)	High (5)	Medium (2)	Low (1)
Economic Viability Concerns	No	Yes	Yes	Yes
Long-term Planning	Yes	Yes	No	No
Perceived Benefits	Yes	Yes	No	No
Resistant to Change	No	No	Yes	Yes
Uncertainty and Risks	No	No	Yes	Yes
Business model	Value-creation		Revenue-generation	

Understanding the preliminary answer presented to RQ2 (that the business model adopted appears a key predictor) is a proposition that requires future study, we turn our attention to RO4 in conjunction with the six aggregate dimensions identified. These dimensions are the building blocks for two grounded models that help create theories to explain social processes and relationships based on participant's voices (Gioia and Pitre, 1990; Corley and Gioia, 2011). Of the six dimensions, two are identified as contextual antecedents that are seen as significant predictors of uptake – a forward-looking (entrepreneurial) outlook in a firm's strategy and an entrepreneurial ecosystem that supports innovation and collaboration. Insights from QUANT data also suggests business owner experience (years in business) and second- and older-generation businesses can exert a predictive influence on uptake.

6.9 Reporting Findings for RO4 (Actor vs Environmental Factors)

Addressing RO4 directly, what are the actor vs environmental characteristics that influence behaviour – it is apparent that the uptake of sustainability practices by SMEs is a variable experience shaped by the interplay of varying structural factors and the agency of business owners. Based on structuration Theory (ST), social systems such as business operations are created through interactions between structures (e.g., regulations, costs) and agents (e.g., SME owners). According to this theory, neither structures nor agents dominate the process. Rather, they co-construct outcomes. To illustrate, businesses adjust strategies and practices based on perceived significance of material versus personal outcomes (Swaab *et al.*, 2014). The reduction of emissions may not be solely for regulatory compliance (a material outcome), but also to bolster a reputation as a sustainability leader (personal outcome) (Kelley *et al.*, 2003a).

The four SME categories identified in Table 36 are based on patterns noted in relation to key theoretical or actor-environmental markers. These SME categories are discussed next in Section 6.9.1, which can explain the varying degrees of adoption noted by SMEs in the sample data. The action characteristics describe technical, managerial and social capital foundations of value creation and the process, such as opportunity recognition, adopted to realise value – how a firm relates to market opportunities (Tyler *et al.*, 2013). The actor-environmental factors associated with each category can help tailor interventions to the unique needs and context of SMEs.

6.9.1 SME Action Characteristics

The four SME categories in Figure 27 were allocated a short-hand tag shown at the head of Table 36. The tags, a summative description of the action characteristics that impact sustainability related behaviour, are useful when discussing the grounded models that emerge from the data. Each SME category was allocated a 5-point summative assessment (low, medium, high) across two dimensions – Capabilities and Mindset. It resultant assessment ranking enables a visual presentation of performance as a relationship between internal capabilities (technical and social capital) and mindset. Firms that perceive sustainability as a strategic opportunity, for example, are more likely to align internal processes and resources to achieving those goals, leading to enhanced capabilities and performance.

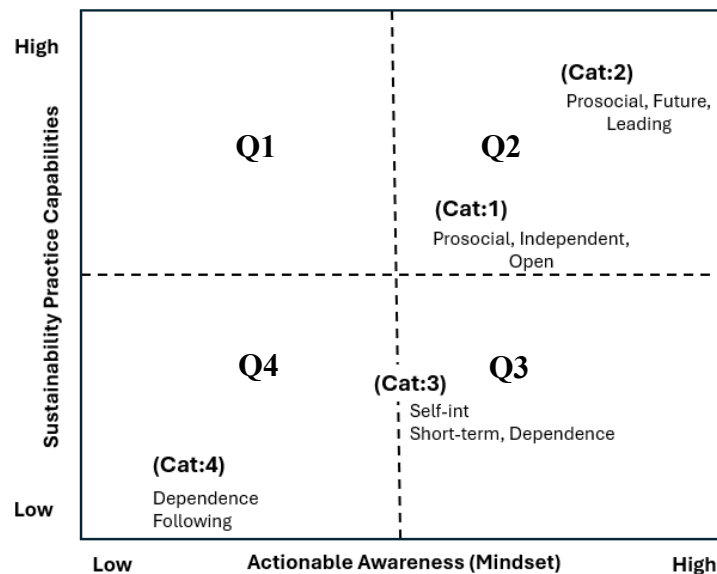


Figure 27. SME Categories—Action Characteristics

Category 2 and to a lesser degree Category 1 SMEs (both placed in Q2) exemplify a positive interdependence between their (proactive) strategies and the wider ecosystem, while those in Categories 3 and 4 are constrained by limited capabilities and/or a short-term, change resistant focus. Actionable awareness is a term to reflect not just awareness but also a strategic mindset that prioritises actions for long-term success. SMEs with high actionable awareness are better positioned to acquire and leverage their internal sustainability capabilities, as they invest in

resources, such as staff training and technological upgrades, or build partnerships in order to enhance their sustainability capabilities.

6.9.1. 1 Category 1 – Prosocial, Independent, Open (**Yes – Substitute**)

SMEs noted as Discovery (of opportunity) oriented businesses as generally positive towards sustainability uptake and proactively initiate ‘substitute’ actions in terms of product of services in strategy planning, and employee training. Attitudinally, these SME owners saw potential opportunity from sustainability. Yes-substitute type SMEs are assessed as moderately high in sustainability capabilities and also in mindset that is geared towards action. The businesses are future oriented, practical and efficient followers, rather than innovative, in adopting sustainability practices. They have the resources and vision to implement sustainability without external pressure.

6.9.1.2 Category 2 – Prosocial, Future, Leading (**Yes – Creative**)

Few (very few) SMEs were noted as creative in their opportunity recognition. These prosocial, future-oriented businesses focused on opportunities and devised new sustainability focused services or products. Owners appeared open to innovation and had integrated sustainability into their business strategies that were aligned to long-term growth. Anticipating future regulations and driven by a vision of long-term sustainability, this business could lead industry standards and shape market trends.

6.9.1.3 Category 3 – Short-term, Dependence (**Yes - But**)

Few SMEs were noted in this quadrant, an allocative entrepreneurial response that represents low sustainability capabilities but a relatively higher awareness (mindset) of sustainability. Cautious, these SMEs are largely constrained by external factors such as financial support or regulatory uncertainty and an inability to see any benefits. Their prime concern is cost-saving practices (such as carbon emissions audits), but these low impact efforts are typically reactive and seen as imposing additional costs and a competitive threat. The businesses offer latent potential for improved sustainability but perhaps require external pressure to shift their focus from immediate needs to an integrated commitment.

6.9.1.4 Category 4 – Dependence, Following (**No – Because**)

This category of SMEs was in the majority. These SMEs are assessed as both low in sustainability capabilities and low also actionable awareness. Owners admitted to not actively taking on sustainability primarily because of external costs (supplier support, technology) considerations, but also identified some internal factors (lack of skills, unclear benefits) that discouraged any motivation to engage meaningfully in sustainability. Business actions are guided by necessity, such as regulatory compliance and risk aversion, and survival is the primary motive. These SMEs are likely to be influenced by industry and external (customer, supplier) pressures to drive change.

6.9.2 Step 3(a): Grounded Model (A)

Grounded Model (A) in Figure 28 presents the relationship between structural and relational factors highlighted in Table 36 that influence practices (Giddens, 1984; Stones and Jack, 2016). External/ strategic structures, such as regulatory environments and industry standards, can constrain or enable effective actions (Revell, Stokes and Chen, 2010), creating the context that drives SMEs to adopt or avoid uptake of sustainability practices. Relational factors like customer perceptions and brand recognition also influence SMEs to align with market needs and local expectations (Adebanjo, Teh and Ahmed, 2016; Cowan and Guzman, 2020).

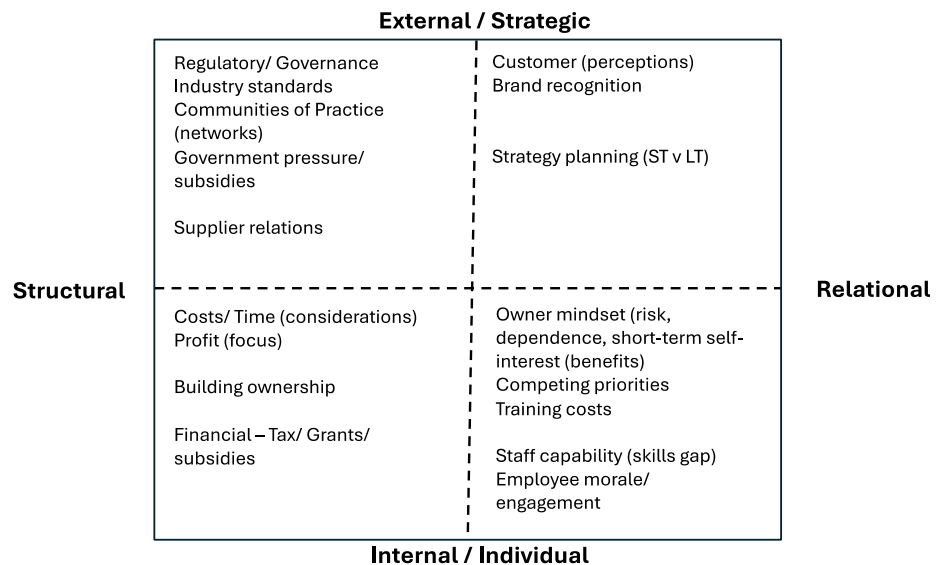


Figure 28. Grounded Model A (SME Owners Voice)

Grounded Model A is a theoretical lens that offers policymakers and practitioners design options that acknowledge the complex interrelations between structure and agency in SMEs. Noticeably, when this illustration (Figure 28) is mapped against the earlier action characteristics of SMEs (Figure 27), it is noticeable Cat 1 and 2 businesses are more active in strategic practices associated in quadrants 1 and 2. In conjunction with Grounded Model B, one is able to design scalable impact.

- External structural constraints such as technology and infrastructure availability appear to significantly influence strategic decisions. Structuration theory suggests these conditions provide the context that SMEs navigate as they make choices to balance profit with sustainability goals (Walker and Preuss, 2008). Costs and the need to prioritise immediate profits can restrict the capacity to invest in long-term sustainability practices, but SMEs are also active agents who can actively leverage government support and strategic planning to align with sustainability objectives.
- Internal factors such as the mindset of business owners, employee morale and skills and external pressures co-create the behaviour of SMEs (Hahn *et al.*, 2018). To illustrate, owner's risk aversion and short-term interests interact with the broader structural environment, enabling or hindering uptake. Understanding these interdependencies within SMEs provides insights into the structural and environmental influences that shape their behaviour (Gaur *et al.*, 2011; De Clercq, Dimov and Thongpapanl, 2015; Agostini and Nosella, 2019).

6.9.3 Step 3(b): Grounded Model (B)

The key challenge for sustainability transition is to scale successful solutions, but there is also a lack of conceptual clarity on what is involved (Woltering *et al.*, 2019). As literature suggests, it requires different skills, as well as coalitions of public, private and civil society and a balance in incentives among key actors (Lambin *et al.*, 2020).

Grounded Model (B) in Figure 29 presents a framework for scalable activity associated with impact across both technology (infrastructure) and people specific practices. High-impact, people-focused (top-right quadrant) practices, such as

leadership-driven sustainability initiatives, customer-driven engagement and community involvement serve as crucial drivers for embedding sustainability into organisational culture. These approaches generate more long-term value by fostering collective commitment to sustainability across the business. In conjunction, the high-impact, technology-focused (top-left) quadrant demonstrates how SMEs can leverage advanced technologies, green supply chains and practice circular economy principles to achieve measurable environmental outcomes and operational efficiencies.

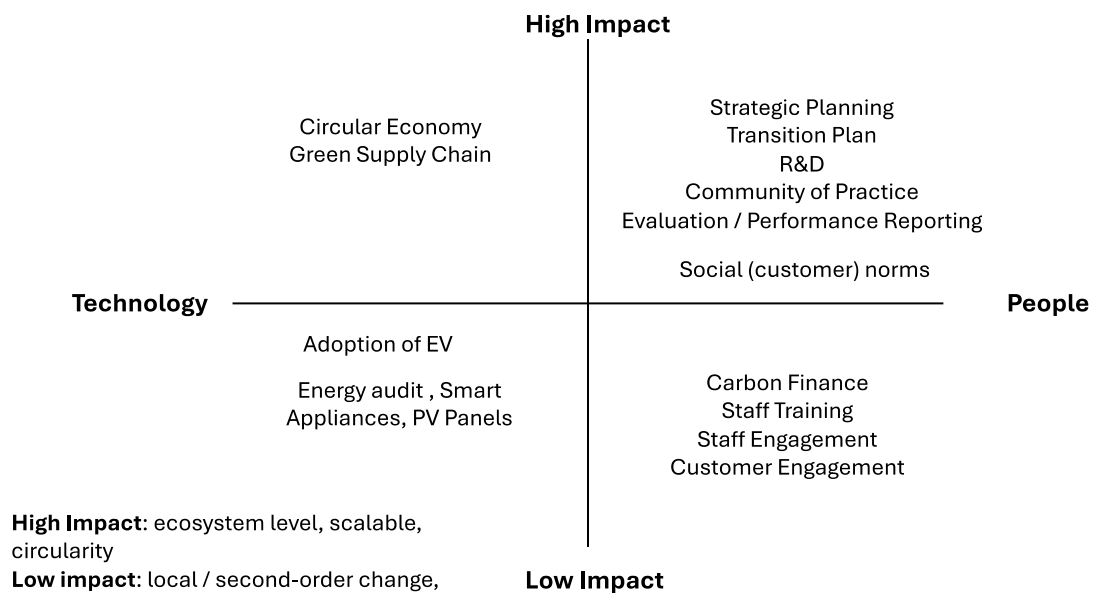


Figure 29. Grounded Model B: Impact Categorisation

These high-impact strategies often require substantial upfront investment, but they also provide sustainable change at scale (Woltering *et al.*, 2019) yielding significant reductions, for example, in resource consumption and environmental impact. As Woltering *et al.* (2019) explains, that scaling requires a different mind shift and skills to standalone projects. It needs a multi-sector, long-term programmatic approach involving both organisational and institutional changes, along with innovations in technology or practice. As related literature notes, technology can act as an accelerant in process optimisation, as well as data transparency, circular products and services and data-based ecosystems (Lambin *et al.*, 2020; Close, Faure and Hutchinson, 2021).

Relative to high-impact practices, low-impact second-order changes contribute to improved sustainability impact, but typically on a lesser scale due to their localised nature or lack of deep integration into core business operations. Interestingly, adoption of EV was not rated high impact by SMEs, perhaps as transportation was not a primary consideration in business operations. On the people-focused (bottom-right) quadrant, second-order changes include initiatives such as carbon finance schemes and staff training. These efforts raise awareness, a necessary condition for change, but they also require depth in strategic alignment for transformative change.

On the technology side (bottom-left), second-order changes might involve conducting energy audits or adopting smart appliances. While these technologies offer incremental improvements in energy efficiency, the impact is often localized and insufficient to drive significant sustainability strategy. An interesting rating by SME owners in relation to EVs as low impact requires some explaining. Like other such second-order changes, though valuable, it is also isolated and fails to catalyse the wider sector where comprehensive transformation is necessary for SMEs to achieve substantial sustainability outcomes.

6.10 A Framework to Support Sustainability Practices in SMEs (RO5)

SMEs are facing increasing societal and regulatory pressure to adopt environmental practices. Yet, the current research demonstrates that, on average, SMEs lag larger firms in doing so (Ernst et al., 2022) and given the significant environmental footprint by SMEs, there are understandable calls for greater adoption of environmental practices (Tyler 2024). In response, there are signs of increased regulations as a coercive measure across many industries worldwide focused on improving the protection of the natural environment. The focus is on both operations and on governance (Banerjee et al., 2003; Tyler 2024). Yet, understanding the scale of transformation needed given the SDG agenda, there is a further challenge to the necessary transition, of ‘scaling up’ successful solutions (Woltering et al., 2019).

Figure 30 presents a process framework to support sustainability practices in Irish SMEs. The framework ranges theoretically from key inputs or antecedents to action and policies that influence uptake and can be measured in scalable impact based on the combined effect of three potentially conflictual, environmental, social and

financial, goals (the triple bottom line). The antecedent and action components integrate study findings with key findings in the literature related to transformation of sustainability through scaling – expanding from local impact to sustainable system change (see Woltering et al., 2019). It requires innovations in technology and practices, as well as co-evolution of organisational and institutional arrangements. The framework is an attempt to capture a processual view in transitioning to the new normal envisioned by Woltering et al., (2019).

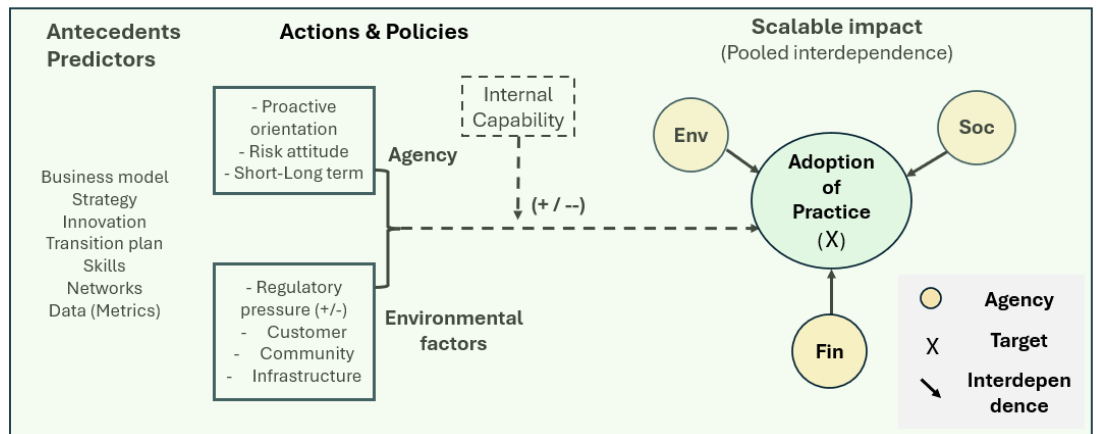


Figure 30 . A Process Framework to Support Sustainability in SMEs

The need to transform at scale is pressing in Ireland, as well as in the EU, and government entities and EU regulations are less visible but highly influential on the structural side of interdependencies. These bodies enforce regulations such as the Climate Act (2021) and impose compliance standards (e.g., Carbon Budget), that pressure SMEs to align with sustainability targets like the Sustainable Development Goals (SDGs) and Net Zero by 2050. Yet implementation and enforcement of these regulations is more performative than substantive. According to (Bromley and Powell, 2012), official policy documents consistently emphasise the need to support business survival, even if this means compromising on sustainability objectives. Noting the non-coercive nature of these policies, the implications are a seeming intentional organisational decoupling of policy and actual business practices (Council of the European Commission, 2020; Government of Ireland, 2019).

Not confined to a single geographic context, but a broad phenomenon across the EU, problematic SME engagement is symptomatic of broader structural issues (Oberthür and Dupont, 2021; Ahern, 2023). Sustainability objectives are evidently

subordinated to survival imperatives (Klewitz and Hansen, 2014b; Hristov, Chirico and Appolloni, 2019). The seemingly obvious approach to translating commitment into practice is by use of regulatory enforcement, yet this approach is also problematic as it does not address the root causes of this reluctance. Literature suggests regulatory pressures fail to foster the necessary agency, and mindset shifts by SMEs (Tyler et al., 2024). Consistent with interdependence theory, this study suggests a more nuanced explanation. On the one hand, shaped by the antecedent revenue-based business model, the tendency by SME owners is to frame sustainability as a threat to operational viability (Tyler et al., 2024). This caution leads them to adopt the minimum practices. Yet, on the other hand, as this research shows, entrepreneurial opportunity (EO) and business model (value-creation vs revenue) are pivotal to SMEs viewing sustainability as an opportunity rather than a threat.

A central theme to understanding the uptake of sustainability practices among SMEs is the dynamic tension between Agency and Environmental factors. Noting the successful adoption of environmental practices must be integrated into the SMEs operations and strategies to obtain the full benefits (Tyler *et al.*, 2024), the framework identifies agency specific factors such as a proactive orientation, risk attitudes, and environmental factors include regulatory pressure, as well as customer and community pressures, and infrastructure. As well, a number of antecedents or predictors are flagged, with scalable impact the desired outcome based on balancing the three TBL (environment, social and financial) considerations.

Clarity in regulatory policy is a clear issue for SMEs. This is distinct to regulatory enforcement associated with soon to apply CSR(D). Given less attention, CSR(D) is a looming shadow and double-edged sword. The common view in literature to mandatory compliance is that standards driven by external pressures and mandates results in delayed or minimal adoption of sustainability practices. The reality is that weak enforcement is, in part, a conscious choice of the Irish national government (and by the European Council). This creates a double-edge sword: while the approach may support business survival, it also results in a disconnect between policy intentions and actual practices adopted by businesses. Less obvious are the unrealised costs of this practice: strong regulatory pressure is reported to reinforce managerial proactive orientation, while weak regulatory pressure leads to opportunity-seeking activity away

from environmental practices (Tyler et al. 2024). Consistent with other literature (see Jansson et al., 2017), it would seem weak regulatory pressures have encouraged managers to avoid future-oriented differentiation and adopt less-than-optimal positions for sustainability. The inevitable calling to account for SMEs in Ireland is not too distant – in the year 2030.

6.11 Chapter Six Summary (Findings related to RQ2)

This study has examined the processual dimension in theorisation, which has been neglected in ecosystem studies according to Harima, Harima and Freiling (2024). Moreover, given the evolutionary nature of entrepreneurial ecosystems, understanding how dominant actors, aka anchor organisations, adapt their functions to respond to dynamic environments is critical (Roundy, 2021). The literature identifies two distinct business models, ‘value creation’ – how a firm configures its activities to create value, and revenue generation (prices and fees) (Child, Witesman and Spencer, 2016). Further, as Harima et al., (2024) suggest, discussions about the interplay between network and resources are absent. Moreover, given that resources are embedded in the network of entrepreneurial ecosystems and the institutional environment of the region, networks and resources must be examined as ‘mutually constitutive entities rather than dichotomous’ ones (Jack and Anderson, 2002; Brown, Mawson and Rocha, 2023).

The summary in Table 36 suggests most SMEs surveyed are operating with a revenue-based model. Noting, the illustrative distribution of SMEs in Figure 30, a fuller answer to RQ2 is that the ‘business model’ adopted by SMEs is a key predictor of uptake. It is predicated on antecedent considerations such as pro-active orientation and innovation, as well as the importance of SMEs viewing sustainability as an integral part of their mission as it is then more likely to innovate and persist in their efforts (Ireland, Covin and Kuratko, 2008; Child, Witesman and Spencer, 2016; DiBella *et al.*, 2023). A second novel consideration linked to the framework is an implicit nascent environmental ecosystem (see Harima, Harima and Freiling, 2021) which is presently characterised by weak social capital.

Four illustrative SME categories or clusters were identified (in Table 36) based on patterns in owner response to key theoretical markers. Categories 1 and 2 SMEs exemplify high interdependence and future-oriented proactive strategies. Those in

Categories 3 and 4 are constrained by their limited capabilities and a shorter-term focus. SMEs with high actionable awareness are better positioned to leverage sustainability capabilities effectively. SMEs that actively perceive sustainability as a strategic opportunity are more likely to align their internal processes and resources towards achieving those goals, leading to enhanced capabilities and economic benefits (Child et al., 2017). Conversely, limited actionable awareness evidently serves to constrain the development of sustainability capabilities.

The two grounded models GM (A) (Fig 28) and GM (B) (Fig 29) respectively, highlight the interdependencies between internal and external, and structural and relational factors (Estrin, Mickiewicz and Stephan, 2013; Dubos, 2017). Crucial drivers to embedding sustainability include leadership-driven sustainability initiatives, customer-driven engagement and community involvement. GM(A) helps categorised firms by awareness and internal capability. Those firms ranked high on awareness and resource capability tend to lead in sustainability uptake, while those with lower awareness and internal resource capabilities tend to be reactive and dependent on external factors such as government support. Understanding these categories allows for targeted interventions in order to shift businesses from inertia towards more proactive and future-oriented sustainability practices.

In summary, accepting that the 'business model' is a key predictor of uptake, it is evident the majority of SMEs are revenue- and cost-oriented, hence preoccupied with survival. That said, when business owners adopt high-impact activities supported by adequate financial and infrastructural resources, similar to patterns observed in other fields, like healthcare, adherence to positive behaviours improves performance and gains broader support (Seguin et al., 2022). In effect, implementing high-impact practices such as green supply chains or joining communities of practice increases SMEs' competitiveness and customer loyalty. Conversely, SMEs that struggle to adopt sustainability practices because of limited resources or are reluctant to change focus on industry norms driven by a "follow rather than lead" mentality Seguin et al. (2022).

Chapter 7: Conclusion

7.1 Introduction

This study examined the challenges and opportunities facing Irish SMEs in their journey to adopting sustainability practices such as energy-efficient measures, waste management, green supply chains, socially responsible marketing and community engagement (Nygaard, Kokholm and Huulgaard, 2022; Smith *et al.*, 2022). The area is described as comparatively underexplored (Gaganis, Pasiouras and Voulgari, 2019; Prasanna *et al.*, 2019; Gholami, Murray and Sands, 2022a; Ozkan, Romagnoli and Rossi, 2023). Thus, while attention in literature is largely focused on large enterprises and on technical solutions, there is a need for greater focus on SMEs where limited resources and a priority on survival makes the transition to sustainability problematic.

EU legislation and CSR(D) reporting will soon impact some SMEs. Yet, sustainability uptake is more than a compliance issue. The aim of this study was to develop an understanding of the challenges and opportunities facing Irish SMEs and to extend this understanding towards activating the collective potential of SMEs as environmental agents. The two research questions were identified. Research Question (RQ) 1: What factors influence the implementation of sustainability practices in SMEs? This RQ was the basis of a quantitative study, using the Theory of Planned Behaviour, of determinants that shape intention and adoption by SMEs in Ireland. Three subordinate research objectives (ROs) were identified as follows:

- RO1: What are actor-specific characteristics that affect the implementation of sustainability practices in SMEs?
- RO2: What are the organisational characteristics that affect the implementation of sustainability practices in SMEs?
- RO3: What are the structural dynamics that affect the implementation of sustainability practices in SMEs?

Knowing structure reliably influences, the path to collective impact was examined using interdependence theory (Van Lange & Balliet 2015). Research

question (RQ) 2 is: *What are the structural and environmental interdependencies impacting sustainability practices?* The two subordinate research objectives are:

- RO4: What are the actor vs environmental characteristics (in Irish SMEs) that influence (sustainability related) behaviour?
- RO5: Identify a framework to support sustainability practices in Irish SMEs.

7.2 Revisiting Study Aim and Objectives

Figure 31 is a visual illustration of the multi-level behavioural challenges SMEs display as they confront the need for genuine sustainability transitions. The prevailing individual and organisational level performance mindsets are shown in the face of multiple structural constraints, including the absent mandate for sustainability reporting (EC 2022). As also illustrated, uptake by Irish SMEs needs to be seen under the shadow of 2030 carbon goals and state-level policy decoupling. Described as "organised hypocrisy" (Sweeney, 2018), intentional decoupling helps explain the gaps noted in literature between policy and practice (Wagner, Lutz and Weitz, 2009; Pacheco-Ortiz, Escobar-Sierra and Suárez-Monsalve, 2024).

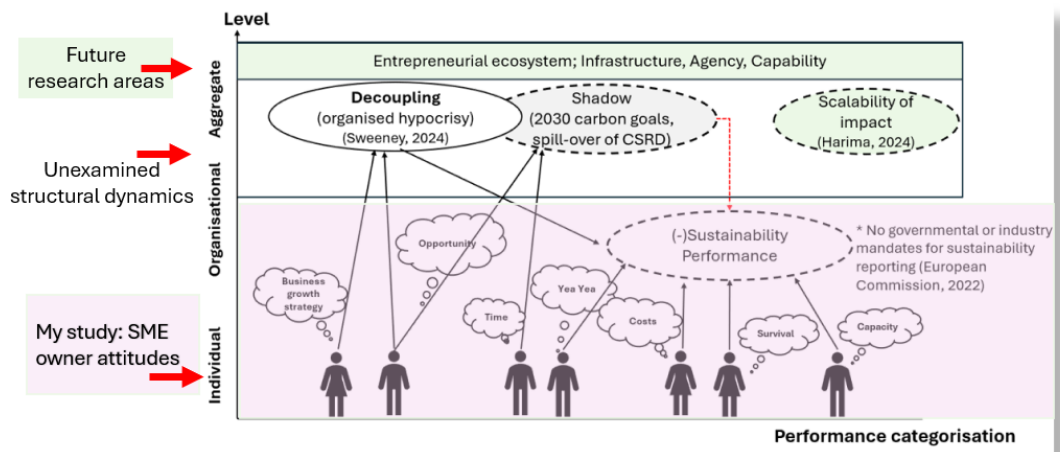


Figure 30. Performance Categorisation

7.2.1 State-level decoupling

Consistent with state policy-related non-enforcement of sustainability, this study highlights state-level decoupling as a considerable norm-shaping structural barrier.

Reported variously as a lack of clarity in the regulatory environment and constant suggestions of ‘greenwashing’ – where businesses overstate the truth or they say something that is not true (Winston, 2010; de Freitas Netto *et al.*, 2020), the evidence is of a ‘nascent’ ecosystem. Characterised by weak regulatory pressure, which seldom encourages SMEs to go beyond what is required (Tyler *et al.*, 2024), understandably, strong awareness by SMEs noted in RQ1 is moderated by decision rules in SMEs that reflect caution and resistance to change (RQ2).

Ireland is also not alone in this policy-practice dilemma. Reviewing the literature on greenwashing, according to Netto *et al.* (2020), the evidence is that it has grown to epidemic proportions. Reflecting the embedded challenges implicit in this barrier to sustainability uptake, the literature suggests a considerable difference in awareness. This gap in the prevalence of ‘green’ regulations is also considerable between developing and developed countries (Delmas and Burbano, 2011; Guo *et al.*, 2018).

7.2.2 Business model

An arguable tipping point noted in relation to engaging innovation and change by SMEs emerged in the concept of business models. Two entrepreneurial models are noted in literature, value-creation or revenue-based (Hilson, Hilson and Maconachie, 2018; O’Donnell, O’Gorman and Clinton, 2021). Of these two models only one helps structure a firm’s value-creating (innovative) capabilities (see Child *et al.*, 2017). Adding further practical insight is the ‘orchestration’ role of dominant actor organisations in an entrepreneurial ecosystems (Harima *et al.*, 2024). As Harima *et al.*, (2024) also adds, there is an evolutionary nature to entrepreneurial ecosystems in which the processual dimension has so far been neglected in theorisation.

Interdependencies noted in Chapter 6 between structure (regulations, government policies, infrastructure) and agency (SME behaviour and mindset) presently appear to create a reinforcing loop that largely sustains the status quo, despite the presence of ambitious SDG targets and wide awareness of sustainability. Most SMEs in Ireland were noted as being in a state of inertia (Cat 4). Positively, consistent with literature, the evidence in this study is businesses that view sustainability as an integral part of their strategy planning are more likely to innovate and persist in their efforts (Child *et al.*, 2017); Harima *et al.*, 2024).

7.3 Summary of Findings

The study findings affirm some existing concepts and interrelationships (such as owner awareness and intention to adopt sustainability) and extends existing knowledge on things we already know – such as structural and relational (social capital) factors. The grounded models help generate some practical concepts or ways of understanding sustainability practices and uptake in SMEs – identifying ways to categorise current performance characteristics and differentiation sustainability activities by high and low potential impact based on ecosystem-wide, scalable change versus local, second-order change.

Importantly, the findings reveal a pivotal tension between short-term business priorities and long-term sustainability goals that is arguably linked to the business model adopted by respective SMEs. The strong focus by a majority of Irish SMEs is on immediate concerns such as economic survival and operational pressures, which appear to drive behaviours often at odds with the broader need of sustainable practices. For small business owners, despite the "shadow of the future" in terms of explicit 2030 carbon goals and longer-term consequences of CSR(D)—collective uptake is largely absent from decision-making processes. The study's results suggests a commonly shared sense of inertia in the uptake of sustainable practices among SMEs.

Further, there is generally an arguable sense of "learned helplessness," with the majority of individual owners persisting with short-term priorities. Despite an awareness of sustainability imperatives, most small businesses appear resistant to change, constrained by time, resources, and survival-oriented priorities. An antecedent or predictor of creative uptake is the business model and a strategy predicated on an entrepreneurial outlook of innovation and collaboration. Notably, also, this study found leadership in SMEs were presently muted. To reiterate, this issue in SMEs deserves future examination, given the widely accepted importance of leadership in shaping behaviour (Liao 2022). The findings are further supported by scholarly research that suggests sustainability leadership presently lacks coherence and / or is fragmented (Eustachio et al., 2023); Sajjad et al., 2023).

Culturally, SME collective behaviour can be described as inertia, encapsulated by the cultural expression of "yeah, yeah" that signifies a recognition of the issue

without any genuine intention to act or reluctant compliance. This suggests that the gap between policy and practice is not only structural, but also deeply embedded in the cultural and operational fabric of SME decision-making. The lack of incentives for consequential actors—be it regulators, policymakers, or business leaders—to close the gap between sustainability goals and implementation is highlighted as a critical issue deserving further study. Without stronger alignment between mechanisms (such as governance, resource allocation networks and R&D), the decoupling of sustainability rhetoric and practice will continue to undermine the effectiveness of both national and EU-level sustainability agendas. This issue fits within the encompassing construct of entrepreneurial ecosystems that noting the weak regulatory systems and limited collaboration could describe SMEs in Ireland as operating in a nascent ecosystem. RO5 offers a process-based framework for implementing sustainability in Ireland.

Lastly, the majority of SMEs appear to fall into categories 3 and 4 (in Q4). Quantitatively, the data would suggest these businesses are mainly retail businesses. These businesses would appear to focus on immediate financial returns and lack the necessary enablers of entrepreneurial outlook and strategic planning. From a theoretical perspective, these SMEs illustrate the distinction between value creation and revenue-driven models (Teece, 2010; Child *et al.*, 2017; Méndez-León, Reyes-Carrillo and Díaz-Pichardo, 2022). Their focus on survival effectively reinforces the status quo, contributing to the inertia, as they inadvertently reinforce existing behaviours rather than encouraging transformational change (Child *et al.*, 2017). These dynamics limit the ability of SMEs to adopt proactive sustainability practices.

7.4 Study Contributions

Table 37 presents the methodological and theoretical contributions. The analytical process based on a Gioia methodological path, departs from inductive reasoning towards an abductive approach that combines emerging data from the field with existing theory. Practically, at a micro level, this study identifies (internal) structural and (external) environmental interdependencies that shape the trajectory of sustainability uptake by SMEs. Collectively, decision rules associated with four entrepreneurial categories are identified: ‘*Yes Innovative*’ and ‘*Yes Substitute*’ that respectively reflect creative or opportunity discovery behaviours, and an allocative (‘*Yes But*’) cautious approach more oriented to immediate returns, but with latent

potential for adaptations in relation to sustainability. A fourth significantly large SME category is titled ‘*No Because*’. This category of business is consistent with survival and maintaining the status quo – typified as a ‘yea yea’ culture.

Theoretically, at a macro level, the findings add two key aspects to the scholarly discourse on sustainability practices in SMEs in Ireland. First, noting two distinct types of business models, value-creation (growth) and revenue (survival) models, this study uses the distinction to explain why some SMEs adopt environmental practices, while others do not. Revenue-based business models lack the necessary (actor-specific) enablers, such as entrepreneurial outlook and strategy planning, and even with the proven benefits of engaging with sustainability, they will likely only adopt environmental practices if required. Second, largely focused on categorical functions, the literature on entrepreneurial ecosystems has so far not given attention to the processual dimension in theorisation.

Table 37. Study Contribution

	Sustainability Intention (RQ1)	Interdependencies (RQ2)
Affirms	<ul style="list-style-type: none"> • Strong awareness and knowledge observed, along with commitment (Journeault, Perron and Vallières, 2021) • Social Pressure from customers and stakeholders influences the uptake of sustainability practices (Ghadge <i>et al.</i>, 2017; Ernst <i>et al.</i>, 2022) • Access to government support (Caldera, Desha and Dawes, 2019; Durrani <i>et al.</i>, 2024) and financial resources are needed (Chege and Wang, 2020). Access to government support (Caldera, Desha and Dawes, 2019; Durrani <i>et al.</i>, 2024) and financial resources are needed (Chege and Wang, 2020). • Sustainability behaviours in SMEs can be influenced by a 	<ul style="list-style-type: none"> • Infrastructure development required for distribution networks and supply chains (Mc Namara, Murro and O’Donohoe, 2017; Thacker <i>et al.</i>, 2019). • SMEs lag behind larger firms in environmental practices and typically, environmental sustainability practices are perceived as an additional cost and competitive threat (Tyler <i>et al.</i>, 2024). • Sustainability practices, on their own, are often insufficient unless paired with other enablers, like infrastructure and strategy planning (Zhang, Li and Ziegelmayr, 2009; Audretsch, Heger and Veith, 2015; Hahn <i>et al.</i>, 2015a;

	combination of internal and external factors Álvarez Jaramillo, Zartha Sossa and Orozco Mendoza (2019).	Thacker <i>et al.</i> , 2019; Shahzad <i>et al.</i> , 2020).
Extends	<ul style="list-style-type: none"> • Lack of strategy for implementing sustainability practices (SP) not solely due to financial constraints (Eggers, 2020b). • Informal systems and lack of planning are identified as hindrances (Parker, Redmond and Simpson, 2009; Wang, Chu and Hao, 2024). • TPB- examined attitudes and found external structures are a strong influence on regulatory pressure, governance and societal norms (Ajzen, 1985; Kautonen, Van Gelderen and Fink, 2015). • Subjective norms may be shaped more by external pressure than internal leadership, suggesting that in small organisations, leadership alone may not significantly influence sustainability norms. • The implication is that SMEs must cultivate a sustainability-driven culture that supports green initiatives and employee behaviour. 	<ul style="list-style-type: none"> • The transition from informal to formal systems through data-driven evaluation of SMEs affirms the Gioia methodology for the study of sustainability (Magnani and Gioia, 2023). • Used interdependence theory in the context of sustainability to identify positive interdependence between proactive strategies and the wider ecosystem (Harima, 2024). • Added the concept of scaling to supporting outcomes; it requires a different mindset and skill (Woltering <i>et al.</i>, 2019). • Entrepreneurial ecosystems in the context of Irish SMEs (Harima, Harima and Freiling, 2024). • Necessity + Opportunity-driven entrepreneurs extend business models in the context of revenue-based and value-driven entrepreneurs (Harima, 2024; Harima, Harima and Freiling, 2024).
Generates	<ul style="list-style-type: none"> • Primary pull factors for SMEs: reducing costs and increased profits. • Additional strategies: community-based infrastructure, and community practices, supplemented by regulatory conditions. 	<ul style="list-style-type: none"> • Grounded Model (A) in Figure 28 (Section 6.9.2) presents the relationship between structural and relational factors highlighted in Table 36 that influence practices (see Giddens, 1984). • Grounded Model (B) in Figure 29 presents a framework for scalable activity associated with impact across both

		<p>technology (infrastructure) and people-specific practices.</p> <ul style="list-style-type: none"> • A process framework to support sustainability in SMEs (section 6.10), Figure 30. • Decision rules associated with four entrepreneurial categories are identified. <ul style="list-style-type: none"> - At a macro level, the findings add two key aspects to the scholarly discourse on sustainability practices. First, the two formative business models are creative and revenue based. Second, largely focused on categorical (age, education, business sector, functions, the literature on entrepreneurial ecosystems has so far not given attention to the processual dimension in theorisation (Harima, Harima and Freiling, 2024). - This study develops a process-based framework (Figure 30) to navigate the nuanced complexities of the various sectors and local contexts for SMEs (Harima, Harima and Freiling, 2024).
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7.4.1 Methodological Contribution

This study advances the use of the Theory of Planned Behaviour (TPB) by situating it within the organisational context of SMEs. The study identifies actor-specific, managerial, and structural factors (RO1, RO2 and RO3) that impact the adoption of sustainability practices within the SMEs, thereby expanding TPB's applicability beyond individual-level analyses to capture organisational-level dynamics.

Next, this study integrates TPB with interdependence theory that establishes a robust theoretical framework that encompasses both internal determinants (such as

beliefs, attitudes, and intentions) and external interdependencies (including structural and environmental factors) that influence sustainability adoption. This combined theoretical approach addresses a critical gap in existing literature, where behavioural intentions are often examined in isolation from broader structural influences.

Lastly, this study uses the Gioia methodology to investigate interdependencies (RQ2, RO4 and RO5) and provides a powerful and nuanced, qualitative exploration of the dynamic interactions between actors, organisations and their environments. This methodological approach enables the study to reveal latent patterns and subtle interdependencies, adding new insights to the Interdependence Theory by examining how context-specific factors, such as structural dynamics and emergent opportunities, shape behaviour within SMEs.

7.4.2 Theoretical Contribution

A notable theoretical insight, which deserves greater consideration in future studies of SMEs, is the concept of business models. The two distinct models, value-creation or revenue-based, are formative as they structure a firm's value-creating capabilities and subsequent value-capturing transactions (Child *et al.*, 2017). Organisations that are focused on survival rather than growth, aided by a weak regulatory framework, perpetuate the status quo that prioritises short-term survival over long-term strategic innovation. Adding further depth to business models is the 'orchestration' role noted for anchor organisations (dominant actors) in entrepreneurial ecosystems (Harima, 2024). The primary considerations are networks and resource allocation. Furthermore, TPB helps distinguish between the will to act and the means to do so, highlighting interdependencies between actor and environmental factors.

Drawing on Harima, Harima and Freiling (2024) and Tyler *et al.* (2024) work, the study can add that for meaningful change to occur, it is necessary to shift away from the status quo sustained by anchor organisations and weak regulatory pressure to empowering actors within the ecosystem—particularly those with an entrepreneurial outlook and a growth-oriented mindset. These businesses, unlike those anchored in survival mode, are better positioned to drive innovation and change (Child *et al.*, 2017). As Harima *et al.*, (2024) also add, there is an evolutionary nature to ecosystems, and the processual dimension of ecosystems has been so far neglected in theorisation.

Based on the earlier four SME categorisations, this study presents a processual-based framework (Figure 30) to navigate the nuanced complexities of the various sectors and local contexts for SMEs. The framework ranges theoretically from key inputs or antecedents to actions and policies that influence uptake and can be measured in scalable impact based on the combined effect of three potentially conflictual, environmental, social & financial goals (aka the triple bottom line). The antecedent and action components integrate study findings with key findings in the literature related to transformation through scaling—expanding from local impact to sustainable system change (see Woltering *et al.*, 2019). It will require innovations in technology and practices, as well as co-evolution of organisational and institutional arrangements.

The framework is an attempt to capture a processual view in transitioning to the new normal envisioned by Woltering *et al.*, (2019). This framework applies to the Irish context but may also be applicable in the wider regional context. For scalable impact and systemic change, actor and structural interdependencies will need to be disrupted and recalibrated. The processes involved are best understood by breaking the approach into four connected parts:

- external structures (like laws and social norms),
- internal structures (like personal beliefs, values and knowledge),
- (actor) people's actions, supported by targeted funding and long-term strategic planning, and
- scalable outcomes of those actions (Stones and Jack, 2016), supported by evaluation using enhanced data (metrics).

7.4.3 Practical Contribution

Consistent with literature, this study of sustainability uptake by Irish SMEs confirmed that environmental awareness (H1a) and knowledge (H1b) is high. Adding insight the QUANT results reveal that enabling infrastructure (H3a), resources (H3b) and funding (H3c) are critical barriers. The central issue with sustainability is the business model that emphasises revenue-based survival. Consequently, leadership in terms of pro-social behaviour, innovation and strategy planning are muted.

These findings highlight the need for targeted investments in local infrastructure to support sustainability efforts in Ireland. The research reaffirms the importance of business models in shaping sustainability pathways (Tyler et al., 2024). In the Irish SME context, many firms remain focused on financial survival, and sustainability is a secondary concern. This suggests sustainability policies and support mechanisms must be tailored to the business model—thus recognising the operational realities of SMEs rather than a one-size-fits-all approach.

The process framework presented in Section 6.10 (Figure 30) responds to calls by Woltering et al. (2019) for more grounded, practice-based solutions. The framework helps develop Harima, Harima & Freiling's (2024) interest in ecosystems and identifies antecedents and aggregate dimensions that influence uptake of sustainability practices. Both areas are underdeveloped and are highlighted as warranting future research. The study also suggests that while there is an urgent need to transform at scale, current regulatory efforts in Ireland appear performative than substantive (see Bromley and Powell 2012). The findings suggest that official policy continues to prioritise business continuity—even if this undermines sustainability goals. Furthermore, it seems that the non-coercive nature of sustainability policies in Ireland has led to an organisational decoupling between policy and practice (Council of the European Commission, 2020; Government of Ireland, 2019). There is an evident policy-practice gap that requires enforcement, and a move beyond symbolic gestures to meaningful and sustainable change.

7.5 Study Limitations

Acknowledging all studies have boundaries, some study limitations of this research are as follows. First, while the sample size of 516 provides substantial data, it does not fully capture the diversity of SMEs across Ireland as the sample was primarily drawn from the Dublin and Kildare regions. This geographic concentration may have influenced the findings, as industry type and location are likely to affect sustainability practice uptake. However, as the study area of sustainability is relatively new and little understood by SMEs, the mixed-method approach helped gain rich data and insights with local nuance that can be used for future large-scale studies. For example, targeted activity areas such as the circular economy may present a way to address collective and scalable impact in the SME business sector.

Second, the reliance on self-reported survey and interview data introduces the risk of social desirability bias. Respondents may have overstated their intentions without corresponding action, reflecting the limited external pressure for sustainability adoption. This limitation is compounded by the theoretical framework's inability—specifically the Theory of Planned Behaviour (TPB)—to account for broader ecosystem and structural dynamics, which play a crucial role in influencing uptake. While the priority of this study was on qualitative interviews and case studies, which offered depth, it also highlighted gaps in understanding scalable solutions and business models that could drive sustainability uptake.

Third, the theoretical framework—The Theory of Planned Behaviour is valuable for understanding behavioural and actor intentions, but it is difficult to capture wider industry-specific factors that shape the intention to adopt sustainability practices. In effect, the TPB framework did not fully capture the complexities of business models or the systemic enablers necessary to scale sustainability practices effectively.

Lastly, this study reflects Ireland's unique regulatory and cultural environment, which may restrict the generalisability of the findings to SMEs in other regions.

7.6 Recommendation for Future Research

This study opens several avenues for further research that can deepen understanding and support more effective sustainability uptake among SMEs. First, the process framework (Figure 30) offers a practical framework for future investigations into entrepreneurial ecosystems and the circular economy. Researchers could adapt this framework to explore how best practices are applied across different types of SME—particularly in Q1 and Q2—and to develop indicators for achieving scalable sustainability impacts.

Second, sustainability leadership within SME merits closer attention. While leadership is widely recognised as a key factor in influencing organisational behaviour (Liao, 2022), current literature identifies a lack of coherence in how sustainability leadership is conceptualised and applied (Eustachio et al., 2023; Sajjad et al., 2023).

Future studies could focus on developing more integrated models of sustainability leadership tailored to the SME context.

Third, there is a need to explore business models that successfully embed sustainability as a source of competitive advantage. This includes examining how SMEs can transition from traditional models to those that support change—reconfiguring their operations to deliver scalable value aligned with sustainability goals (Woltering et al., 2019).

Finally, future research could investigate underexplored but highly relevant variables identified in Figure 31. Organised hypocrisy or what is commonly termed decoupling (Sweeney, 2024)—where firms express commitment to sustainability while acting contrary to those values, is reported in Ireland. As well, there is a shadow side to carbon targets, in relation to Ireland achieving its 2030 carbon emission goals. A further consideration is the matter of scaling impact of sustainability practices in a fragmented policy and infrastructural landscape. Examining the dynamics associated with these research areas will provide a deeper understanding of the structural tensions and institutional contradiction that shape SME behaviour.

7.7 Closing Remarks

The role of Irish SMEs and the adoption of sustainability practices remains relatively underexplored, but it is an important area in sustainability research. In Ireland, SMEs are still not operating at their full potential. Rather, these SMEs can be seen as passive players rather than active agents of systemic change when it comes to sustainability. Given the requirements of Corporate Sustainability Reporting Directive (CSRD) and what can be termed the shadow of hard targets (see Pg.75), Irish SMEs will be challenged by the currently voluntary Environmental, Social and Governance commitments (Ahern, 2023).

As well, in the journey towards sustainability, while smaller enterprises are credited with contributing much needed innovation and agility (Khaled, Ali and Mohamed, 2021), the potential of Irish SMEs for innovation and wider impact on sustainability practices are hindered by a focus largely on short-term survival and immediate economic stability. This inertia is reinforced by a weak regulatory

framework that fails also to incentivise innovation and proactive engagement with sustainability. As a result, despite research indicating that proactive participation in sustainability can generate long-term benefits and competitive advantages, it seems that many Irish SMEs will wait till required by law.

To bring systemic change, a key precursor factor appears to be an entrepreneurial mindset and leadership that is directed towards system-level transformation in a suitably reorientated entrepreneurial ecosystem that supports greater resource sharing and collaboration needed for knowledge sharing. This interplay highlights the necessity for a twofold strategy that requires cultivating psychological readiness (mindset) and building/creating an enabling environment (ecosystem). The framework (RO5) offers a process-based approach to support SMEs overcome challenges and unlock new opportunities for growth and innovation in Ireland's business landscape.

7.8 Personal Reflection

As I conclude this chapter of my academic journey, I recognise that my PhD has been more than an academic endeavour; it has been a stepping stone in a larger commitment to creating positive change. This journey has given me invaluable knowledge, enhanced my analytical rigour, and strengthened my belief that meaningful research can inspire actionable solutions. Yet, this transformation was not immediate—it began with the uncertain steps of a novice researcher, filled with curiosity and ambition but lacking the methodological precision and analytical skills to navigate the complexities of academic research.

My early days as a new scholar were filled with insecurity that often influenced my research approach; I hesitated to take ownership of my ideas and often sought constant validation. I think I was going through imposter syndrome where my judgement was clouded by self-doubt. Eventually, I learned to embrace the discomfort of the unknown and the uncertainty that came with it and used it as a catalyst for my growth and personal development. A pivotal moment came when I discovered the role of interdependence in my work. While much of my research required independence—designing surveys, analysing data, and writing—I came to see the immense value of pooled interdependence, particularly the contribution of my supervisory team for

which I am immensely grateful. This dynamic taught me the importance of rigorous, evidence-based thinking and structured analysis, which became foundational to my work. The discovery of the Gioia methodology in my study was a further transformative moment. I realised the complexity and the rigour of the method. It allowed me to combine quantitative precision with qualitative depth to address the complexities of sustainability practices in Irish SMEs. Soon enough I mastered tools like SPSS, AMOS and NVivo. This synergy between logical analysis and interpersonal connection ensured my research was methodologically robust and addressed the problems with both precision and empathy.

Today, I am immensely proud to say that this research not only taught me how to be a good researcher but also helped me find and use my voice as a researcher in society. I moved from describing other perspectives to integrating diverse theoretical insights and data to create meaning from my viewpoint, weaving together literature and evidence in a way that felt uniquely mine. Where I once viewed writing and speaking at conferences as a daunting challenge, I now see it as a platform to express my ideas confidently and authentically. This transformation was made possible through academic growth and my supportive network—my supervisors, friends, and colleagues—who encouraged me and gave me opportunities to learn.

Reflecting on my journey, I realise how much I've transformed since the beginning. My PhD has been more than an academic pursuit; it has been a journey of becoming—one that has transformed me into a stronger, more authentic version of myself and reinforced my dedication to contributing to the pursuit of sustainability.

***** End of Thesis *****

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Appendices

Appendix 1: Systematic Literature Review SLR Dataset

#	Author	Country	RQ	Theoretical Framework	Paper Type /Method	Industry	Challenges
1	Abbasi & Nilsson (2012)	Mixed	What sustainability themes have been studied in relevant literature related to supply chains, especially concerning logistics and transport? RQ2. What are the main challenges, identified in previous research, in making supply chains environmentally sustainable?	N/A	SLR	Mixed	Mindset, cultural changes, uncertainties, complexity, costs, operationalisation
2	Adebanjo, Teh, & Ahmed (2016)	Mixed	To investigate the direct effect of external pressure on environmental outcomes and manufacturing performance and examine the mediating effect of sustainable management practice	Institutional Theory Resource-Based Theory	Survey/ SEM	Mixed	External pressure
3	Álvarez Jaramillo, Zartha Sossa & Orozco Mendoza (2019)	Mixed	What sustainability management tools, including tools for corporate social responsibility and tools for environmental management, have been designed for and are applicable to SMEs?	N/A	SLR	Mixed	175 identified barriers, classified by “sector,” “sustainability tool,” and “internal/external”

4	Asad et al. (2021)	Pakistan	Does transformational leadership has a significant role on sustainable human resource practices?	Transformational Leadership Resource-Based Theory Ability-Motivation Opportunity (AMO) theory	Survey	Mixed	Leadership sustainable human resource practices and sustainable innovation between transformational leadership and the performance
5	Bajada et al. (2022)	Australia	What are the enablers of innovation precincts, with a focus on measuring the relative importance of these enablers and their contribution to innovation and economic outcomes	Analytical Hierarchy Process (AHP)	Survey	Mixed	Innovation challenges governance and policy challenges
6	Caldera, Desha & Dawes (2019)	Australia	How can lean and green practices enable SMEs to achieve sustainable business practice”, and “What are the barriers hindering sustainability performance of SMEs?”	Institutional Theory	Interview	Manufacturing	Lack of knowledge, skills & awareness; Time Constraints Lack of financial resources Organisational Culture Regulation and policies.
7	Cantele & Zardini (2020)	Italy	To capture the theoretical interdependencies of pressure, benefits, and barriers with sustainability	Social Capital Theory	Survey/ SEM	Mixed	Entrepreneur's and employee's attitude Lack of resources, time Fear of losing competitiveness
8	Chege, Samwel Macharia & Daoping Wang (2020)	Kenya, Africa	<ul style="list-style-type: none"> What internal or external contextual elements would promote the engagement of SMEs in the implementation of sustainable practices? What are the entrepreneur characteristics related to the implementation of sustainable practices by SMEs? 	Technology-Organization-Environment model Technology Adoption Model	Survey	Agribusinesses	Financial resources Technology Owner-manager's perception

9	Dey et al. (2019)	UK	Could lean, when considered as mediator between SPR and performance, enhance supply chain SP of SMEs	Institutional Theory Resource-Based Theory	Case Studies + Survey (SEM)	Mixed	Lack of information on the cost-benefits Weak external pressure/incentives, lack of internal capacity (e.g., financial/human resources, technologies, business processes, and [R&D] activities), weak supporting frameworks, and in many cases, political indulgence by policymakers
10	Durrani et al. (2024)	Pakistan	To explore the internal and external factors that contribute to achieving environmental sustainability in SMEs of Pakistan.	Social Capital Theory	Interviews	Mixed	Lack of finance & education Government support Government support and regulations SME owner/manager awareness & attitude
11	Ernst et al. (2022)	Germany & Austria	<ul style="list-style-type: none"> Does an SME's controlled CS motivation have an influence on its CS performance. Which stakeholder groups weaken the controlled CS motivation of an SME through their pressure and which stakeholder groups reinforce it? 	Stakeholder Theory	Survey	Mixed	Stakeholder pressure Lack of customer demand Lack of resources/time/knowledge Regulation Motivation Social Proximity
12	Felicio, Meidutė, & Kyvik (2016)	Portuguese, Norway & Lithuania	Examine the relationship between global mindsets and the internationalisation behaviour in SMEs.	Information-processing theory	Survey (SEM)	Mixed	Cultural differences resource constraints Lack of experience Mindset

13	Ghadge et al. (2017)	Greece	<ul style="list-style-type: none"> To identify and classify the major factors (drivers and barriers) influencing the green practices in FSC management through a comprehensive literature review. To assess the level of importance of each driver and barrier using collected data on the Greek dairy SC To examine the stability of drivers and barriers by conducting a sensitivity analysis 	Analytical Hierarchy Process (AHP)	Literature Review	Dairy	Financial constraints Lack of knowledge & awareness Regulatory & compliance issues Market & customer pressure Supply chain complexities
14	Giunipero, Hooker, & Denslow (2012)	USA	The purpose of this study was to identify the drivers and barriers currently facing purchasing and supply chain management sustainability implementation efforts.	Supply chain management	Literature Review Delphi Analysis Interviews	Mixed	Economic Uncertainty Investment costs Top-management commitment Supplier engagement Perceived lack of technology Change resistance Lack of resources Lack customer demand
15	Govindan et al. (2014)	India	What are the barriers to implementing green supply chain management (GSCM) in Indian businesses?	Analytical Hierarchy Process (AHP)	Interviews + Survey	Mixed	Lack of commitment Financial constraints Lack of awareness & knowledge Regulatory and policy issues Technological Barriers Market Competition
16	Johnson (2015)	Germany	How aware are managers of small and medium-sized enterprises (SMEs) about sustainability management tools, and how effectively are these tools are implemented?	Roger's Diffusion of Innovation Theory	Survey	Mixed	Lack of perceived benefits Lack of demand Limited government support resource constraint Lack of know-how

17	Johnson & Schaltegger (2016)	Mixed	<ul style="list-style-type: none"> • Which specific sustainability management tools have been proposed and observed in SMEs? • What reasons are provided why SMEs should implement sustainability management tools? • What main reasons may explain why most SMEs are not implementing such management tools? • What key criteria are emphasised in the literature that such management tools must fulfil in order to improve their applicability in SMEs? 	N/A	SLR	Mixed	Lack of awareness & knowledge Resource constraints Complexity of tools External Pressure- Customer demand
18	Journeault, Perron & Vallières (2021)	Canada	<ul style="list-style-type: none"> • To identify the key collaborative roles that different stakeholders can play to support sustainability adoption in SMEs • To understand how these stakeholder roles contribute to overcoming the different barriers associated with adoption 	Stakeholder Theory	Case Studies	Mixed	Lack of awareness resource constraints Lack of skills and expertise

19	Kerr (2006)	Australia	<ul style="list-style-type: none"> How does enterprise leadership strategy affect the process of integrating the environmental functions with the management systems of SMEs and larger enterprises to achieve sustainable business? What are the lessons to be learnt from the above-mentioned process in leading enterprises that may be useful to SMEs? 	Systems Thinking Approach	Interviews	Manufacturing	Resource limitation Lack of expertise Regulatory and market pressure Cultural resistance Lack of standardised metrics
20	Khaled, Ali & Mohamed (2021)	Egypt	To explore how the Sustainable Development Goals (SDGs) are integrated into corporate sustainability performance and to identify the extent and determinants of this integration ¹ .	Stakeholder Theory	Surveys Interviews Document analysis	Mixed	Lack of strategy & Planning Lack of standardised metrics Lack of resources Regulatory & market pressure
21	Kiefhaber, Pavlovich & Spraul (2020)	New Zealand	<ul style="list-style-type: none"> Which of the owner–manager’s identities play a role in SME sustainability? What is the relationship between sustainability-related identities and the institutional environment? How do the owner–managers’ inner conflicts impact on sustainability-related identities and on their institutional environment? 	Identity theory Institutional theory	Interviews	Hospitality	Conflict between personal values and business pressure Lack of unified sustainability identity Lack of regulatory framework Cultural and social norms Resource constraints

22	Klewitz & Hansen (2014)	Mixed	The study aims to map existing practices, identify the extent of Sustainability Oriented Innovation adoption, and determine the factors that influence these innovations ¹ .	N/A	SLR	Mixed	Resource constraints Lack of expertise Regulatory and market pressure Measurement and Reporting
23	Kraus et al. (2020)	Germany	What are the antecedents and factors which drive SME owner-manager behaviour in relation to sustainability and regional/local economic dynamics?	Micro-foundations of Sustainability	Interviews	Manufacturing	Resource constraints Lack of awareness Economic rationale Cultural Employee centric awareness
24	López-Pérez, Melero & Javier Sese (2017)	Spain	Examines the potential impact of CSR on a series of outcomes—understood as a compendium of metrics that reflect both the financial and the non-financial components (corporate reputation and brand image) in SMEs.	Social Capital Theory	Survey	Mixed	Resource constraints Lack of knowledge and expertise Market pressure Lack of standardised metrics

25	Madrid-Guijarro & Duréndez (2024)	Spain	<ul style="list-style-type: none"> Do pressures to implement sustainability increase management commitment to sustainability? Do barriers to sustainability decrease management commitment to sustainability? Does management commitment positively impact environmental performance? Does management commitment mediate the relationship between the pressures in favour of and barriers against sustainability and the environmental performance of SMEs? 	Institutional stakeholder upper echelon theories	Survey (SEM)	Mixed	Employee attitude Time constraints Resource limitations Environmental pressure Regulatory compliance Market forces Community influence
26	Masurel (2007)	Netherlands	Why do SMEs invest in environmental issues?	Theory of Planned Behaviour	Survey	Mixed	Resource constraints Lack of consumer demand Organisational culture Lack of regulatory framework
27	Moore & Manring (2009)	USA	Why do SMEs need to articulate and use SD business plans for integrating factors of globalization within social and ecological limits to growth?	Hart–Milstein matrix	Conceptual Paper	Mixed	Lack of knowledge resource constraints Regulatory complexities Lack of strategy planning

28	Oxborrow & Brindley (2013)	UK	<ul style="list-style-type: none"> What factors affect SMEs awareness and proclivity to adopt eco-advantage? How can sustainability innovations be applied to small firms? What issues emerge in implementing eco-advantage in SMEs 	Stakeholder Theory	Case Studies	Mixed	Resource constraints Knowledge gap Market pressures Regulatory Challenges Supply chain issues
29	Paillé, Boiral & Chen (2013)	China	To analyse the relationships between Environment Management Practices (EMPs) and Organisational Citizenship Behavioural Issues (OCBEs) with a view to improving our understanding of the factors that promote voluntary environmental initiatives among employees.	Theory of Planned Behaviour	Survey	Mixed	Lack of organisational support Resource allocation issues Lack of supervisory support Lack of employee commitment
30	Prashar (2019)	India	This study is to develop an easy to apply managerial framework for guiding the implementation and reporting of energy sustainability	Stakeholder Theory	Case studies	Manufacturing	Resource constraints Lack of expertise Regulatory compliance Technological barriers Market pressures
31	Suriyankietkiet, Krittayaruanroj & Iamsawan (2022)	Thailand	<ul style="list-style-type: none"> What are the essential sustainable leadership practices and sustainability competencies for sustainability and resilience in a CBSE context? How can a CBSE business apply the theoretical frameworks in practice to survive and thrive for sustainable futures, especially during the COVID-19 era? 	Sustainability-Oriented Leadership Stakeholder Theory	Interviews + case studies	Mixed	Knowledge constraints Resource constraints Market pressure Community engagement

32	Walker, Di Sisto & McBain (2008)	UK	<ul style="list-style-type: none"> • What drives public and private sector organisations to integrate environmentally friendly practices in their supply chains? • What are the barriers to environmentally friendly practices in the supply chain? 	Stakeholder Theory	Interviews	Mixed	Supply chain complexity Market pressure Regulatory complexity
33	Wu & Pagell (2011)	USA	How do organisations balance short-term profitability and long-term environmental sustainability when making supply chain decisions under conditions of uncertainty?	Grounded Theory	Case studies	Mixed	Financial pressures Complexity of supply chains Lack of clear metrics Regulatory uncertainty Cultural resistance

Appendix 2: Ethics Approval

The screenshot displays the Vidatum Academic web application interface. At the top, the Maynooth University logo and 'Vidatum Academic' branding are visible, along with navigation links for Home, Profile, Publications, and Grants. A user greeting 'Welcome KANISHKA MENDHEKAR' is shown in the top right corner. The main content area is titled 'Notifications and Tasks' and features a list of notifications. A modal window titled 'Message' is open, displaying an ethics approval notification. The notification includes the subject 'Ethics Approval', a message to Kanishka Mendhekar stating that their ethics review has been approved, and details about the review ID (36430) and the project title ('SUSTAINABILITY PRACTICES IN SMALL-MEDIUM SIZED ENTERPRISES (SMEs)—ANALYSIS OF POLICY IMPLEMENTATION & IMPACT'). It also instructs the user to login to RIS to view the application and review it. The notification was sent on 29/05/2023 at 9:25:09 AM. The background shows a list of notifications with 'Ethics Approval' and 'Ethics Submission' entries, each marked as 'New'. A 'Login As' section is visible on the right side of the interface.

Message

Subject:
Ethics Approval

Message:
Dear Kanishka Mendhekar,

Your Ethics Review has been now been approved:

- Ethics Review ID: 36430
- PI: Kanishka Mendhekar
- Title: SUSTAINABILITY PRACTICES IN SMALL-MEDIUM SIZED ENTERPRISES (SMEs)—ANALYSIS OF POLICY IMPLEMENTATION & IMPACT

Please login to RIS in order to view the application and review it.

Send At:
29/05/2023 9:25:09 AM

Appendix 3: Survey Instrument

Section 1: General Background

1. Gender— ☐ Male ☐ Female ☐ Other
2. Age _____ ☐ I prefer not to say
3. Education level completed _____
4. Job position _____
5. Is your small business (SB) a family business? ☐ Yes ☐ No
6. If yes, are you the— ☐ Founder ☐ Successor ☐ Second generation ☐ Later generation.
7. Which best describes your organisation's primary activity?
 - Accounting Services
 - Communications
 - Construction
 - Education
 - Electronics, Information Technology, Internet, Telecommunications
 - Engineering Services
 - Financial (Banking, Investments)
 - Government
 - Health Care
 - Insurance
 - Legal Services
 - Manufacturing
 - Natural Resources (Agriculture, Forestry, Fishing, Mining and Extraction)
 - Nonprofit Organisation
 - Pharmaceuticals
 - Real Estate
 - Retail
 - Transportation
 - Travel Accommodations and Food Service
 - Utilities
 - Wholesale
 - Other Industry (Please specify)
8. What would encourage you to invest in renewable energy sources? Please rank (drag and drop) the following in order of priority (1 is the highest priority and 7 is the lowest priority).
 - Potential cost savings
 - Positive environmental impact
 - Availability of government incentives or subsidies

- Enhancing brand reputation and customer perception
 - Meeting regulatory requirements
 - Meeting industry standards
 - Access to expert support (apps, consultants)
9. What would encourage you to invest in waste management? Please rank (drag and drop) the following in order of priority (1 is the highest priority and 7 is the lowest priority).
- Potential cost savings
 - Positive environmental impact
 - Availability of government incentives or subsidies
 - Enhancing brand reputation and customer perception
 - Meeting regulatory requirements
 - Meeting industry standards
 - Access to green sources (supply chain management)
 - Access to expert support (apps, consultants)

Section 2: Sustainability Practices

*Briefly, **sustainability practices** involve strategies and initiatives that integrate environmental and social considerations into business operations. For small businesses, this includes actions to reduce carbon emissions, optimize energy usage output, implement waste management systems, promote ethical labour practices, community engagement and responsible supply chain management.*

10. Have you set specific targets or goals in any of the following areas? (Select all that apply)
- Achieving carbon neutrality or net-zero emissions
 - Implementing energy efficiency improvements
 - Reducing waste generation
 - Conserving water resources
 - Using green supply chain management
 - Preserving biodiversity
 - Socially responsible marketing
 - Invite customer participation in sustainability actions
 - A customer take-back program to reduce waste disposal
 - Promoting diversity and inclusion within the organisation
 - Other _____

P1: Are you personally involved in implementing sustainability practices within the business?

☐ Very Involved ☐ Somewhat involved ☐ Not involved.

P2: Can you explain the biggest challenge (for your business) in implementing better sustainability practices? _____

Section 3: Attitude

	Specific Awareness	Practices-	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
			1	2	3	4	5
1	I am aware of the EU targets for energy and waste set up for small businesses in Ireland						
	• Recycle 55% of municipal waste by 2030		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	• 32% of energy consumption derived from renewable sources by 2030.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	I manage the impact of my business by—						
	• Using energy-efficient practices such as (smart thermostats, LED lighting, energy audits, etc)		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	• Using waste reduction practices such as reducing, recycling, reusing, refurbishing, etc.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	❖
	• Prioritizing suppliers and partners who use environmentally responsible practices		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	• Encouraging employees to participate in green initiatives		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	• Listening to customer feedback and adapting our sustainability practices		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Commitment	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
1	I am interested in reducing the impact of my business on the environment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	I consider how my decisions may affect the environment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3	I feel committed to keeping the best interests of the environment in mind.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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	Knowledge	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
1	I buy products and packages that are environmentally safe.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	I know more about recycling than the average person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	I select products and packages that reduce the amount of waste ending up in landfills.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	I understand the environmental phrases and symbols on product packages.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	I am knowledgeable about environmental issues.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Attitude	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
1	It is good for my business to engage in sustainability practices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	It is rewarding for my business to engage in sustainability practices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	It is valuable for my business to engage in sustainability practices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	It is meaningful for my business to engage in sustainability practices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 4: Social Aspects

	Leadership	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
1	I encourage pro-environmental behaviour at work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	I/My employer informs staff about projects on sustainability in the organisation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3	I/My employer explain(s) the business environmental policy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	I learn environmentally friendly behaviour at work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	There is supervisory support for the environmental effort by employees.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Sustainability Culture	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
1	My business provides information to all employees on the importance of sustainability.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	My organisation promotes sustainability as a major goal across all departments.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	My organisation has a clear policy on sustainability in every area of operations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	Sustainability is a high-priority activity in my business	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	Sustainability is a central value in my business	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	My business has a responsibility to be sustainable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Customer Social Pressure	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	Customers—	1	2	3	4	5
1	Set high social standards in their buying decision.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	Show strong awareness about social pressure.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	Prefer purchasing from firms with a strong social image.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	Need complete information to assure our social compliance.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Regulatory Compliance	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
1	Government and regulatory bodies influence my business to improve sustainability practices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	Government and regulatory bodies offer help to improve sustainability practices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Government Regulation	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
GR1	Government regulation and policies have influenced my uptake of —					
	• Recycling programs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	• Usage of eco-friendly packaging	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	• Usage of biodegradable materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	• Energy efficiency practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	• Employee health and safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	• Community engagement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	• Upkeep of sealing and insulation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	• Emission reduction targets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	• Energy audits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Subjective Norm	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
1	Most of my business stakeholders (shareholders, employees, community, etc) think we should engage in sustainability.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	Most of the internal stakeholders (employees and management) would approve of my business engaging in sustainability.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3	Most organisations, whose opinions are valued by my business, engage in sustainability.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	Many businesses similar to my business engage in sustainability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 5: Perceived Behavioural Control (PBC)

	PBC	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
1	It is easy for my business to engage in sustainability.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	It is possible for my business to engage in sustainability.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	The decision to engage in sustainability is under my business' authority	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	The decision to engage in sustainability is under my business' control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Access to Infrastructure	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
1	My business has access to infrastructure and equipment to support the uptake of—					
Ai1	• Recycling Programs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
AI2	• Usage of eco-friendly packaging	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
AI3	• Usage of biodegradable materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	• Energy efficiency practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	• Employee health and safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	• Community engagement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	• Heat pumps for heating and cooling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	• Energy storage solutions to store excess energy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	• Electric vehicles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Access to Resources	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
1	I believe I have the following resources when it comes to implementing sustainability practices in my business—					
	• Time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	• Financial resources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	• Human resources (e.g., skilled staff, trained personnel)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	• Technological resources (software for data analysis, technologies for monitoring waste, energy etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	• Education and training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Sustainability Funding	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
SF1	I am aware of funding sources from the Irish Government to advance sustainability practices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SF2	I know how to apply for sustainability-focused funding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SF3	It is easy to apply for sustainability-focused funding.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SF4	I have all the resources needed to apply for sustainability-focused funding.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SF5	I have the opportunity (time) to apply for sustainability-focused funding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Intention to engage in sustainability	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
1	My business is committed to practising sustainability.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2	My business plans to engage in sustainability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	My business has the intention to engage in sustainability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	My business has taken steps to engage in sustainability.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Actual Sustainability Behaviour	Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree
		1	2	3	4	5
	Environmental Practices					
1	My business has implemented waste management practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	My business is committed to using green-sourced materials in our products/services.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	My business monitors energy consumption	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	My business has a target to reduce energy consumption in the next year.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	Water conservation is a priority for my business.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Social Practices					
1	My business promotes diversity among our employees.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	Employee health and safety are a top priority for our business.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	We engage with local communities through sustainability initiatives.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	My organisation supports employee well-being programs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	We prioritise ethical sourcing in our supply chain.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Governance Practices					
1	We regularly review and update our risk management strategy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2	We have a good understanding of government regulations relevant to our industry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	We report on environmental, social and governance (ESG) performance annually	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	Our financial performance is aligned with sustainability goals and initiatives.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	Owner rights and engagement are important aspects of our governance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Those are all our questions. Thank you very much for your time. Your input is appreciated.

Appendix 4: Indicative Interview Questions

1. Does your business incorporate sustainability into its operations?

a. Any examples of specific initiatives or practices?

2. What motivated you to integrate sustainability into your business? Was there a particular event or realization that sparked this commitment?

- Social (customer demands, other competitors)
- Industry standards, Government regulation/ subsidies
- Realization (Climate change, carbon footprint)

3. Do you measure and track the environmental impact of your business activities?

a. What specific metrics or indicators do you use?

- (ISO 14001, ISO 50001, BREEAM (Building Research Establishment Environmental Assessment Method): LEED (Leadership in Energy and Environmental Design)
- If no, ask why (not aware? Difficult to use, any other reason?)

4. What tools or systems does your business utilise to track and report on its sustainability goals and progress?

- Do you have a database system?
- Is there a specific person who tracks and prepares reports?
- How often do you publish these reports?
- Where are these reports published?

5. What measures has your business taken to reduce energy consumption? Can you share some examples

- Energy Audits, energy system management, monitoring and benchmarking
- Usage of smart appliances, maintenance, and system upgrades

6. What measures has your business taken to increase energy efficiency?

7. What steps do you take to dispose of e-waste generated by your business? Do you have any recycling or responsible e-waste management programs in place?

- E-waste recycling program, audits, compliance, and regulations

8. Do you have any recycling or responsible e-waste management programs in place?

9. Have you aware of circular economy principles to minimize e-waste and extend the lifespan of products or equipment?

- What strategies for recycling, refurbishment, donation etc?
- If unaware, ask why (not aware? Difficult to use, any other reason?)

10. What challenges or barriers do you face in implementing SP, in particular energy-related sustainability practices?

a. How have you overcome them?

- What are key considerations - costs, lack of awareness/knowledge, resistance to change, complex process, lack of resources
- Limited supply chain transparency, limited demands, infrastructure resistance, lack of support networks

11. What challenges or barriers do you faced in implementing e-waste sustainability practices?

12. Are your employees and stakeholders engaged in promoting sustainability practices with your organisation?

- How - seminars, workshops, training programs, PDs
- Awareness campaigns, incentives/ recognition

13. Have you observed any positive (or negative) impacts on your business as a result of your sustainability initiatives?

- cost savings, increased customer loyalty, or improved brand reputation
- What is the priority benefit you would like to see?

14. What steps have you taken to reduce waste and promote recycling or upcycling within your business?

15. Are there any social or community-focused initiatives that your business is involved in as part of its sustainability efforts?

- Community partnership, CSR, donations, community engagement and consultation

16. How do you approach the selection and sourcing of materials products to align within your sustainability goals?

- Life cycle assessment, supply chain transparency, organic & recyclable materials

17. Can you discuss any long-term sustainability targets or goals your business has set for the future?

- Carbon neutrality/ net zero emission, energy efficiency improvements, waste reduction, water, biodiversity reservation, diversity & inclusion

18. Are there any specific certifications or standards your business follows to ensure its sustainability practices are in line with industry best practices?

19. Are you aware of the various grants available to help SP?

20. Thank you. Of all the above, what is the most important concern for your small business?

Appendix 5: Participant Information Sheet



SRESC TEMPLATE

Purpose of the Study.

I am Kanishka Mendhekar, a Doctoral student in the School of Business at Maynooth University. As part of the requirements for my PhD degree, I am undertaking a research study under the supervision of Dr Keith Thomas and Dr Fabiano Pallonetto. The study is concerned with the sustainability practices of SMEs with regards to energy and e-waste.

What will the study involve?

The study will involve the participation of key decision makers—business owners, senior managers and executives of SMEs. The study involves participation in a survey which would take around 10-15 mins to complete and the semi-structured interview is envisioned to have a duration of 45 mins to 1 hour. Lines of inquiry will include the perceptions on the intention to adopt sustainability practices related to energy and e-waste and assess the impact sustainability practices.

Who has approved this study?

This study has been reviewed and received ethical approval from Maynooth University Research Ethics Committee. You may have a copy of this approval if you request it.

Why have you been asked to take part?

The research participants have been asked because this study focuses on the practices of key decision-makers of SMEs who are responsible for making crucial decisions for the organisation.

Do you have to take part?

No, the research participants are under no obligation whatsoever to take part in this research. However, we hope that the research participants will agree to take part and give us some of their time to participate in an interview with the researcher. It is entirely up to the research participants to decide whether or not they would like to take part.

It is entirely up to the research participants to decide whether or not they would like to take part. If the research participants decide to do so, they will be asked to sign a consent form and be given a copy of the information sheet for their own records. If the research participants decide to take part, they are still free to withdraw at any time without giving a reason and/or to withdraw their information. A decision to withdraw at any time, or a decision not to take part, will not affect the research participants' relationships with Maynooth University in any way whatsoever. It is to be noted that it will not be possible to withdraw after the data has been anonymized and integrated with other data from the interviews in the software.

What information will be collected?

Data will be collected through surveys and interviews. The interviews will be audio and video recorded with the informed consent of the participants before being transcribed and analysed. The types of information which will be sought after by the researcher will include anecdotal evidence of the sustainability practices of SMEs as well as participants' personal experiences and opinions regarding adoption and implementation of their business' sustainable practices.

Will your participation in the study be kept confidential?

Yes, all information that is collected during the course of the research will be kept confidential. No names will be identified at any time. The identity of the organisation taking part will also be anonymized, with only the descriptive information disclosed being that to which sector their organisation belong. All hard copy information will be held in a locked cabinet at the researchers' place of work, electronic information will be encrypted and held securely on MU PC or servers and will be accessed only by the researcher, Kanishka Mendhekar, and the research supervisors, Dr Keith Thomas, and Dr Fabiano Pallonetto.

No information will be distributed to any other unauthorized individual or third party. If you so wish, the data that you provide can also be made available to you at your own discretion.

Please note the following:

'It must be recognized that, in some circumstances, the confidentiality of research data and records may be overridden by courts in the event of litigation or in the course of investigation by lawful authority. In such circumstances, the University will take all reasonable steps within law to ensure that confidentiality is maintained to the greatest possible extent.'

What will happen to the information which you give?

All the information you provide will be kept at Maynooth University in such a way that it will not be possible to identify you. On completion of the research, the data will be retained on the MU server. After ten years, all data will be destroyed (by the PI). Manual data will be shredded confidentially, and electronic data will be reformatted or overwritten by the PI in Maynooth University.

What will happen to the results?

The research will be written up and presented as a final thesis for submission for consideration for a PhD. Further outputs may include individual paper submissions to academic conferences, peer-reviewed journals, and/or industry publications. A copy of the research findings will be made available to you upon request.

What are the possible disadvantages of taking part?

The researcher (Kanishka Mendhekar) does not envisage any negative consequences for the research participants in taking part, but the researcher (Kanishka Mendhekar) is of course available to discuss any potential concerns the research participants may have regarding participation.

What if there is a problem?

At the end of the interview, the research participants will have the opportunity to elaborate on how they found the experience and how they are feeling. The research participants may contact the researcher's supervisors, Dr Keith Thomas or Dr Fabiano Pallonetto by email (Keith.Thomas@mu.ie) or (Fabiano.Pallonetto@mu.ie) or the ethics committee at Maynooth University by email (research.ethics@mu.ie) if they feel the research has not been carried out as described above.

Any further queries?

If you need any further information, you can contact the researcher by email: Kanishka.mendhekar@mu.ie

If you agree to take part in the study, please complete and sign the consent form overleaf.

Thank you for taking the time to read this.

Appendix 6: Consent Form

I.....agree to participate in Kanishka Mendhekar's research study titled Sustainability Practices in Small-Medium Sized Enterprises (SMEs)—Policy, Implementation & Impact.

Please tick each statement below:

The purpose and nature of the study has been explained to me verbally & in writing. I've been able to ask questions, which were answered satisfactorily. ☐

I am participating voluntarily. ☐

I give permission for my interview with Kanishka Mendhekar to be audio-video recorded. ☐

I understand that I can withdraw from the study, without repercussions, at any time, whether that is before it starts or while I am participating. ☐

I understand that I can withdraw permission to use the data right up to final thesis in June 24. ☐

It has been explained to me how my data will be managed and that I may access it on request. ☐

I understand the limits of confidentiality as described in the information sheet ☐

I understand that my data, in an anonymous format, may be used in further research projects and any subsequent publications if I give permission below: ☐

[Please Select as appropriate]

I agree to quotation/publication of extracts from my interview ☐

I do not agree to quotation/publication of extracts from my interview ☐

I agree for my data to be used for further research projects ☐

I do not agree for my data to be used for further research projects ☐

I agree for my data, once anonymized, to be retained indefinitely in the IQDA archive ☐

I do not agree for my data once anonymized, to be retained indefinitely in the IQDA archive ☐

Signed..... Date.....

Participant Name in block capitals

I the undersigned have taken the time to fully explain to the above participant the nature and purpose of this study in a manner that they could understand. I have explained the risks involved as well as the possible benefits. I have invited them to ask questions on any aspect of the study that concerned them.

Signed..... Date.....

Researcher Name in block capitals **KANISHKA MENDHEKAR**

If during your participation in this study you feel the information and guidelines that you were given have been neglected or disregarded in any way, or if you are unhappy about the process, please contact the Secretary of the Maynooth University Ethics Committee at research.ethics@mu.ie or +353 (0)1 708 6019. Please be assured that your concerns will be dealt with in a sensitive manner.

For your information the Data Controller for this research project is Maynooth University, Maynooth, Co. Kildare. Maynooth University Data Protection officer is Ann McKeon in Humanity house, room 17, who can be contacted at dataprotection@mu.ie. Maynooth University Data Privacy policies can be found at <https://www.maynoothuniversity.ie/data-protection>.

Appendix 7: Supervisor's Letter to the Ethics Committee



Scoil Ghnó Ollscoil Mhá Nuad
Maynooth University School of Business

Research Ethics Committee,

Maynooth University

Re: Supervisor Letter in Support of Ethics Application for PhD Student – Kanishka Mendhekar

Dear Chair of the Committee,

This letter is in support of the ethics application submitted for the PhD work of Ms. Kanishka Mendhekar. The requirements are fourfold:

Preparedness

Kanishka has completed a significant literature review in the area of the PhD on the topic – “Knowledge Management and Sustainable Performance in Family Business”.

Competence

Kanishka has already completed a taught module in the School of Business designed for PhD students who wish to carry out qualitative work. As such, she is well prepared for this phase of her research.

Confidence in ability to meet risks

Kanishka has already completed one module on qualitative methods. As part of her experience and within the modules, typical risks are addressed. Both supervisors of Kanishka are always available for questions during the research fieldwork.

Support from Supervisor and Department

Kanishka will receive support from the department to help ensure that she has time to complete her fieldwork and space to interview respondents should they wish to be interviewed in a neutral location. From the supervisor side, we will be available for meetings on a regular basis throughout the fieldwork and have started to work to identify approaches to contact key informants needed in the industry. We have also reviewed the draft application and the list of proposed questions.

Should the committee have any questions, my supervisors, Dr. Keith Thomas and Dr. Fabiano Pallonetto, will be happy to answer them.

Yours sincerely,

Dr. Keith Thomas & Prof. Fabiano Pallonetto

School of Business

Appendix 8: Business Reports

	Literature/ business case source	Key ideas
1.	Adomako and Ahsan, 2022, Entrepreneurial passion and SMEs' performance: Moderating effects of financial resource availability and resource flexibility', Journal of Business Research, 144(August 2020), pp. 122–135.	The priority for Irish SMEs is business survival
2.	Agostini, L. and Nosella, A. (2019) 'Inter-Organisational Relationships Involving SMEs: A Bibliographic Investigation into the State of the Art', Long Range Planning, 52(1), pp. 1–31	Infrastructure governance
3.	AIB Roadmap: https://aib.ie/content/dam/frontdoor/business/docs/sector-expertise/aib-sustainability-roadmap.pdf	Corporate Sustainability Reporting Directive (CSRD) in effect in 2024; it will impact SMEs <ul style="list-style-type: none"> the concept of 'Double Materiality' - disclose: <ul style="list-style-type: none"> risk from climate change and impact on environment and society suppliers – who are often SMEs and will need to be in a position to provide this information (Scope) Reduced operating costs can enhance profitability Sector Sustainability Guides and Sustainability Grants
4.	Bartolacci, F., Caputo, A. and Soverchia, M. (2020) A Bibliometric and Systematic Literature Review', Business Strategy and the Environment, 29(3), pp. 1297–1309	Sustainability and Financial Performance of Small and Medium Sized Enterprises:
5.	Batrancea, L.M. et al. (2022): Insights from a Panel Data Study Spanning Sixteen Years', Sustainability, 14(22), p. 15318.	SMEs Financing and Impact on Economic Growth Across EU

6.	Bellucci, Pennacchio and Zazzaro (2019)	Financial incentives, such as tax breaks or grants, are crucial in encouraging SMEs
7.	Burke, A. (2015) in Corporate Social Responsibility in Europe: United in Sustainable Diversity. Springer, pp. 17–35.	National action plan on CSR in Europe:
8.	CSO (2021) Small and Medium Enterprises Business in Ireland 2021 – Detailed Results - Central Statistics Office. Available at: https://www.cso.ie/en/releasesandpublications/ep/p-biidr/businessinireland2021detailedresults/smallandmediumenterprises/ (Accessed: 13 October 2024).	SMEs accounted for 69.2% of all persons employed In 2021, micro enterprises (<10 persons employed) accounted for 92.6 of all enterprises
9.	Central Statistics Office (2023) Ireland 2023: The Year in Numbers.	SMEs accounted for 99.8% of all enterprises, 69.2% of employment and 34.8% of GVA in the Irish business economy. In 2021, micro enterprises (<10 persons employed) accounted for 92.6 of all enterprises, Almost half (45%) of the new cars registered in Ireland between Jan and Oct 2023 were electric, plug-in hybrid, or hybrid
10.	Department of Enterprise, Trade and Employment, 2015 - https://enterprise.gov.ie/en/news-and-events/department-news/2015/january/enterprise-ireland's-end-of-year-statement-2014.html	Grow jobs, regional entrepreneurship and start funds
11.	Department of Business, Enterprise and Innovation, 2019; 1. Regional Technology Cluster Fund: to build resilience in the small and	regulatory frameworks are resource-intensive and overwhelming for...(SMEs) Promote innovation and improve SME productivity

	medium- sized enterprise (SME) sector regionally; drive exports	
12.	Enterprise Ireland 2014 https://www.localenterprise.ie/Documents-and-Publications/Entrepreneurship-in-Ireland-2014.pdf	Improve productivity in SMEs
13.	Enterprise Ireland 2019: https://www.enterprise-ireland.com/documents/2019-annual-report-and-accounts-en-71870.pdf	Greater scale through entrepreneurship, innovation, leadership development
14.	European Commission, (2024) National Grid, 2021	Carbon Emission and Scope 1, 2, 3
15.	EY: How Irish SMEs are veering towards sustainable business models https://www.ey.com/en_ie/insights/private-business/how-irish-smes-are-veering-towards-sustainable-business-models#:~:text=A%20recent%20global%20EY%20survey%20of%20more%20sustainable%20business%20models .	COVID – opportunity to invest in online/ digital capabilities Financial fragility of many businesses exposed Many Irish private businesses are seeing the growth opportunity from providing sustainability solutions in areas such as packaging, energy consumption, and many more
16.	Gyamfi et al. (2024)	A study of European SMEs - non-financial support termed ‘framework conditions,’ are significant /affect collaborations and indirect effect on innovation
17.	Martinez-Cillero, M., Lawless, M. and O’Toole, C. (2020) ‘Covid-19 Pandemic and SME Revenues in Ireland: What’s the Gap’, Economic and Social Research Institute Quarterly Economic Commentary, pp. 113–147.	Revenue/ costs focus

18.	<p>OECD: SME and Entrepreneurship Policy in Ireland (2019) https://www.oecd.org/content/dam/oecd/en/publications/reports/2019/10/sme-and-entrepreneurship-policy-in-ireland_98364cba/e726f46d-en.pdf</p> <ul style="list-style-type: none"> - Global Entrepreneurship Monitor (GEM) report on Ireland, popular culture in the country is very supportive of entrepreneurship - Fear of failure in Ireland increased over 2010-13, and has remained stable at this higher level since - primary motivation by nascent entrepreneurs and new owners in Ireland is “to increase income” - local characteristics matter in new firm formation (broadband infrastructure, level of education, industry diversity) 	<p>SME productivity; Business Development (services)</p> <p>Challenges for policy:</p> <ul style="list-style-type: none"> - Foster networks and clusters - Need policy coordination across government - Role of local bodies - Facilitating youth, women, migrants <p>Why Ent? no better alternative” or “seeking to maintain income Spatial differences</p>
19.	<p>SEAI: https://www.seai.ie/seai-research</p> <ul style="list-style-type: none"> - Research section provides details on research projects and funding in Ireland - Energy management 	<p>Various funding agencies: SEAI, DAFM (Agriculture), DoT, EPA EC, GSI, IRC, SFI, others</p>
20.	<p>SEAI: https://www.seai.ie/sites/default/files/seai-research/international-energy-funding/horizon-europe/Navigating-EU-Funding-Opportunities-for-SMEs-Reference-Guide.pdf</p>	<p>SMEs and Energy Grants / best practices Addressing key barriers to... (retrofits) Smart meters & tariffs; exemplar energy management Energy audits (criteria) – help SMEs reduce use and cut costs Financial support if not green SMEs / green farmers</p>
21.	Small Firms Association, 2024	Raise awareness, but also not enforce sustainability

22.	SMEs in Ireland (European Commission, 2019)	Mitigating compliance and administrative costs ROI is the primary consideration for sustainability investments
23.	Sweeney, 2018 on Government in Ireland (and the EU Commission)	Shadow reality of CSR(D) and SMEs; SMEs push back and delay implementing
24.	Neville and Lucey (2022)	Capital structure of high-tech Irish SMEs
25.	Dublin Chamber. Available at: https://portal.dublinchamberhosting.com/News-and-Media/Newsletters/ArtMID/1596/ArticleID/534/Business-Failures-in-Ireland-Up-By-54 (Accessed: 17 October 2024).	Tyrrell, K. (2024), Business Failures in Ireland Up By 54%,
26.	WEF (2023), Data Unleashed: Empowering Small and Medium Enterprises (SMEs) for Innovation and Success, World Economic Forum	Proactive data governance and resilient IT infrastructure
27.	World Bank Group (2019) World Bank Group Support for Small and Medium Enterprises (SMEs), DOI: 10.1596/IEG142212.	Impact evaluation (2016) Support for innovation and entrepreneurship (2013)
28.	EY (2024) Growing number of Irish businesses commit to sustainability as benefit to bottom line becomes clearer https://www.ey.com/content/dam/ey-unified-site/ey-com/en-ie/insights/sustainability/documents/ey-state-of-sustainability-2024.pdf	Regulatory concern Preparedness for sustainability reporting Regulatory compliance and Entrepreneurial outlook
29.	Deloitte (2022) Using Sustainability Reporting to Drive Behavioural Change	Sustainability and business models Stakeholder engagement
30.	Retail Ireland Strategy IBEC (2023-2026) A Sustainable Future for Irish Retail	Supply chain Issues Customer perceptions Sustainable communities (Social Pressure)

