

Enablers in SME Circular Economy Engagement

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Lead organisation: Maynooth University



Environmental Protection Agency

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3. Office of Evidence and Assessment
4. Office of Radiation Protection and Environmental Monitoring
5. Office of Communications and Corporate Services

The EPA is assisted by advisory committees who meet regularly to discuss issues of concern and provide advice to the Board.

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What did the research aim to address?

Small and medium-sized enterprises (SMEs) dominate the Irish economy, accounting for almost all active businesses and a significant share of employment. Despite growing interest among SMEs in the circular economy (CE), existing research indicates that SMEs face a distinctive set of challenges or barriers when attempting to adopt CE practices. This project examines how Irish SMEs are engaging with the CE, the challenges they face and the supports that enable them to adopt more sustainable practices. Understanding how SMEs currently engage with the CE is essential to inform the development of effective policies, supports and tools for SMEs. This research combines insights from academic literature, policy analysis, a nationwide SME survey and a case study. The project's bottom-up approach involved direct engagement with SMEs to ensure that the findings reflect real-world business experiences across a range of sectors, including retail, manufacturing, hospitality and construction.

What did the research find?

Overall, the research finds that while many SMEs express positive attitudes towards sustainability, their engagement with the CE remains limited and uneven. Most SMEs focus on practical, low-risk actions such as improving resource efficiency, reducing waste and increasing recycling. More advanced approaches – such as designing products for reuse or repair, or adopting circular business models – are much less common. A range of barriers were identified, including financial constraints, limited capacity, lack of technical expertise, risk aversion and external challenges such as unclear regulations and limited infrastructure.

Despite these challenges, the research also identifies a strong set of enablers that can support SMEs in adopting circular practices. Financial supports, including grants and tax incentives, are particularly important for overcoming upfront cost barriers. Access to training, technical advice and guidance and infrastructure is also critical. In addition, external drivers such as customer demand for sustainable products, clear and consistent regulations, and certification opportunities can encourage SMEs to engage more actively. An important contribution of the research is the identification of “micro-enablers” such as repair skills and a culture of resource efficiency. These are small, often overlooked factors within businesses that can make circular practices easier to adopt. Recognising and building upon these internal strengths can help SMEs take their first steps towards improved circularity without significant investment. The research also highlights the importance of tailored, sector-specific approaches and supports.

How can the research findings be used?

The CE represents both a challenge and an opportunity for Irish SMEs. While barriers remain significant, the research shows that, with the right combination of supports, capabilities and mindset, SMEs can move towards more circular practices in their day-to-day business.

To support practical action, the research provides a roadmap for SMEs. This includes assessing internal capabilities, developing a clear sustainability vision, experimenting with small-scale initiatives, combining innovation with business planning and leveraging external supports and partnerships. A case study of an Irish SME illustrates how these steps can be applied in practice, demonstrating how waste materials can be transformed into new products through creativity, collaboration and persistence. For policymakers and support organisations, the research highlights the need for coordinated, accessible and practical interventions. For SMEs, the message from this research is clear: circularity is not only about sustainability – it also offers improvements in efficiency and long-term competitiveness.

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Executive Summary

Small and medium-sized enterprises (SMEs) dominate the Irish economy, accounting for almost all active businesses and a significant share of employment. With increasing environmental pressures and evolving regulations and customer expectations, SMEs are being encouraged to rethink how they use resources and manage waste. The circular economy (CE) offers a practical approach to achieving this by reducing waste, keeping materials in use for longer and identifying new revenue opportunities. This research examines how Irish SMEs are engaging with the CE, the challenges they face and the supports that enable them to adopt more sustainable practices. This research combines insights from academic literature, policy analysis, a nationwide SME survey and a case study. A key feature of the research is the bottom-up approach, which involved direct engagement with SMEs through workshops and a survey. This ensured that the findings reflect real-world business experiences across a range of sectors, including retail, manufacturing, hospitality and construction.

Overall, the research finds that, while many SMEs express positive attitudes towards sustainability, their engagement with the CE remains limited and uneven. Most SMEs focus on practical, low-risk actions such as improving resource efficiency, reducing waste and increasing recycling. These activities are often driven by cost savings rather than broader strategic goals. More advanced approaches – such as designing products for reuse or repair, adopting circular business models or developing partnerships for material reuse – are much less common. This suggests that SMEs are at an early stage in the circular transition and may not yet fully realise the wider business benefits of circular practices. A range of barriers help explain this pattern. Financial constraints are among the most significant, with many SMEs finding it difficult to invest in new technologies, processes or business models. Time pressures and competing priorities also limit their capacity to explore new approaches. In addition, many SMEs lack the technical knowledge or expertise needed to implement circular solutions, and awareness of available supports remains low. External challenges, such as unclear regulations, limited infrastructure (e.g. recycling or reuse facilities) and

uncertain market demand for circular products, further complicate adoption. Moreover, internal company factors such as risk aversion and a focus on short-term performance can prevent adoption.

Despite these challenges, the research identifies a strong set of enablers that can support SMEs in adopting circular practices. Financial supports, including grants and tax incentives, are particularly important for overcoming upfront cost barriers. Access to training, technical advice and step-by-step guidance is also critical, helping SMEs build confidence and capability. Infrastructure, such as local recycling systems and logistics networks, plays a key role in enabling practical implementation. In addition, external drivers such as customer demand for sustainable products, clear and consistent regulations, and opportunities for certification or public recognition can encourage SMEs to engage more actively. An important contribution of the research is the identification of “micro-enablers”. These are small, often overlooked factors within businesses that can make circular practices easier to adopt. Examples include employees with repair skills, existing relationships with suppliers or recyclers, or a company culture that values resource efficiency. While these micro-enablers may not be formally recognised in CE assessments, they can act as starting points for innovation and experimentation. Recognising and building on these internal strengths can help SMEs take their first steps towards improved circularity without significant investment.

The research also highlights the importance of tailored, sector-specific approaches. Different sectors face different challenges and opportunities, meaning that a one-size-fits-all strategy cannot work. Instead, targeted supports that reflect sector-specific needs are required. To support practical action, the study provides a roadmap for SMEs. This includes assessing internal capabilities, developing a clear sustainability vision, experimenting with small-scale initiatives, combining innovation with business planning and leveraging external supports and partnerships. A case study of an Irish SME (Forest Living) illustrates how these steps can be applied in practice, demonstrating

how waste materials can be transformed into new products through creativity, collaboration and persistence. In conclusion, the CE represents both a challenge and an opportunity for Irish SMEs. While barriers remain significant, the research shows that, with the right combination of supports, capabilities and mindset, SMEs can move towards more

innovative and value-creating circular practices. For policymakers and support organisations, the research highlights the need for coordinated, accessible and practical interventions. For SMEs, the message is clear: circularity is not only about sustainability – it also offers improvements in efficiency and long-term competitiveness.

1 Introduction

Small and medium-sized enterprises (SMEs) make up 99.8% of all enterprises currently operating in Ireland and account for two-thirds of national employment (see Table 1.1) (CSO, 2025). As environmental pressures, regulatory expectations and market demands for responsible business practices intensify, SMEs face increasing pressure to rethink how they use resources and manage waste. Against this backdrop, the circular economy (CE) offers a practical and strategic pathway for SMEs to strengthen competitiveness while contributing to national sustainability goals.

For SMEs, the CE is not a single fixed model, but a flexible and practical approach to improving how resources are used. In this project, we developed our own definition of the CE for SMEs as follows: “finding practical and feasible ways to reduce waste, keep valuable resources in use and explore new revenue models, all while remaining competitive in a market that increasingly values sustainability”. There is not only one version of the CE, and there is a role for every business, regardless of size or sector. For some SMEs, circularity may involve designing products for easier repair or refurbishment; for others, it may mean increasing reuse or recycling potential, using recycled inputs in production, shifting towards service-based offerings such as renting or leasing, or partnering with other firms to reuse materials that would otherwise become waste. The diversity of these pathways highlights the need for tailored, sector-sensitive approaches rather than one-size-fits-all solutions.

Despite growing interest, SMEs often struggle to adopt CE practices due to limited time, resources and information, as well as uncertainty about where

to start. Recent national reviews highlight persistent information gaps, low awareness of available supports and a tendency to focus on waste management that does not reflect the wider potential of circular approaches for Irish businesses (Geissdoerfer *et al.*, 2017; Bassi and Dias, 2019). As a result, SMEs risk missing emerging opportunities such as cost savings, new market niches, enhanced resilience and alignment with evolving regulations.

This project is therefore both timely and necessary. Understanding how SMEs currently engage with the CE, the challenges they face and the opportunities available to them is essential for designing effective policies (rules), supports (funding/advice) and tools. By using a bottom-up, co-creation approach, this project captures real-world experiences and insights at scale, helping to build a more accurate and nuanced picture of CE engagement across sectors.

1.1 SMEs and the Circular Economy

Ireland has intensified its policy focus on the CE through national strategies, regulatory reforms and targeted funding initiatives, reflecting broader EU commitments such as the Circular Economy Action Plan.¹ Recent assessments, however, reveal that CE activity within Irish SMEs remains uneven and often narrowly concentrated in waste management practices (OECD, 2022). This legacy focus on waste suggests that the broader potential of circularity spanning product design, material optimisation, service innovation and industrial symbiosis remains underexplored. National surveys and EPA-funded

Table 1.1. Overview of enterprises in Ireland (percentage of total for all enterprises)

Enterprise size	Active enterprises	Persons employed	Turnover	GVA
SMEs (<250 persons employed)	99.8	67.9	43.1	40.6
Large enterprises (250+ persons employed)	0.2	32.1	56.9	59.4

GVA, gross value added.

Source: CSO, 2022.

¹ https://environment.ec.europa.eu/topics/circular-economy-topics/first-circular-economy-action-plan_en

studies² highlight substantial information deficits, with Irish SMEs reporting limited awareness of CE incentives, weak familiarity with circular business models and difficulty accessing relevant guidance (Enterprise Ireland, 2019). Despite these challenges, interest in sustainability is growing, particularly as resource constraints, supply chain volatility and evolving consumer expectations place pressure on firms to enhance operational efficiency and environmental performance. These trends position circularity not as an abstract environmental ideal but as a pragmatic business strategy that aligns with SMEs' needs for stability, cost management and market competitiveness.

1.2 Evolution of Circular Economy Policy in Ireland

Institutionally, Ireland has strengthened its governance arrangements to support the CE transition. A dedicated Circular Economy Unit was established within the Department of the Environment, Climate and Communications (DECC) (now known and referred to henceforth in this report as the Department of Climate, Energy and the Environment (DCEE)) to lead policy development and oversee the Whole of Government Circular Economy Strategy (2021). Updated every 18–24 months, the strategy aims to raise Ireland's circularity rate above the EU average by 2030, promote public sector leadership, stimulate investment, enhance awareness and address regulatory and social barriers to circular practices.

To support implementation, an interdepartmental Circular Economy Working Group and a national multi-stakeholder advisory group are being developed. The EPA complements this work through its Circular Economy Programme, which replaces the National Waste Prevention Programme (NWPP) and focuses on capacity building, data generation, innovation funding and vertical coordination across levels of government. A forthcoming Circular Economy Bill³ will give statutory effect to the strategy, transpose EU legislation and activate measures such as the levy on single-use cups.

CE principles are also increasingly referenced across broader policy frameworks, including the Programme for Government and the Climate Action Plan, although the CE is still often interpreted primarily through a waste management lens rather than as a wider economic transformation. While DCEE provides national leadership, agencies such as Transport Infrastructure Ireland⁴ are beginning to embed circularity into sectoral operations. Figure 1.1 shows the policy framework of the CE in Ireland.

1.3 Literature Review

The academic literature offers a nuanced picture of how SMEs are currently engaging with the CE and what this implies for future development. Empirical studies consistently show that SMEs tend to approach circularity through practical and tangible actions such as designing products for repair and refurbishment, enhancing reuse and recycling potential through modular or recyclable components, integrating secondary materials into production, adopting service-based models such as leasing or maintenance services, or collaborating with other firms to exchange by-products in forms of industrial symbiosis (Manninen *et al.*, 2018; Prieto-Sandoval *et al.*, 2018; Konietzko *et al.*, 2020; Voulgaridis *et al.*, 2020). These practices not only demonstrate the adaptability of circularity but also highlight how SMEs often prioritise incremental low-cost changes that offer immediate operational benefits (García-Quevedo *et al.*, 2020).

Moreover, engagement with circularity strengthens competitive positioning, particularly as sustainability becomes a differentiator in public procurement, investor scrutiny and consumer purchasing decisions (Enterprise Ireland, 2019). Alignment with emerging EU and national policy frameworks, ranging from eco-design requirements to extended producer responsibility and sustainability reporting, also positions SMEs ahead of regulatory shifts, reducing future compliance burdens while contributing to national objectives on waste prevention and carbon neutrality (Howard *et al.*, 2022; Tseng *et al.*, 2023).

Yet the literature also points to persistent weaknesses. SME engagement remains confined to end-of-pipe

2 <https://www.epa.ie/publications/research/reports/research-492-artificial-intelligence-as-an-enabler-of-the-circular-economy.php>

3 <https://www.gov.ie/en/department-of-climate-energy-and-the-environment/policy-information/circular-economy/>

4 <https://www.tii.ie/media/s3jotzfz/tii-circular-economy-strategy-2023-2025.pdf>

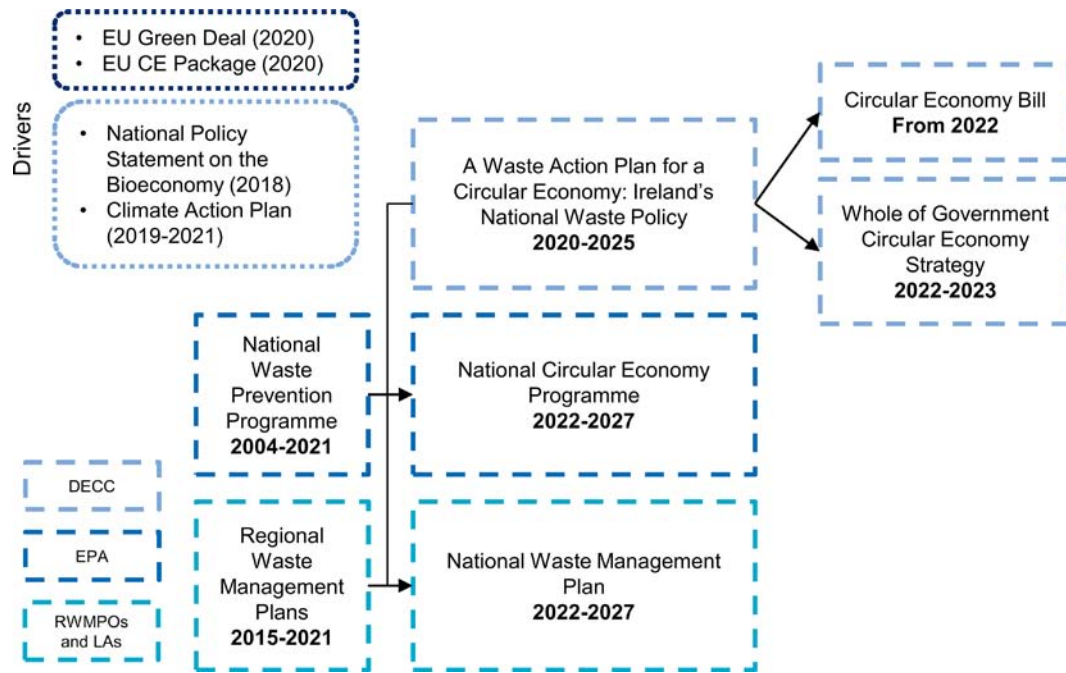


Figure 1.1. Connection between various CE policies in Ireland. LA, local authority; RWMPO, regional waste management planning office. DECC refers to the department that is now known as DCEE.
Source: OECD, 2022, *The Circular Economy in Ireland*, <https://doi.org/10.1787/7d25e0bb-en>.

waste management rather than higher-value circular strategies that emphasise design, durability or service innovation (Chaudhuri *et al.*, 2022; Alcalde-Calonge *et al.*, 2024). Studies note that circular business models are still weakly understood, often perceived as abstract or overly complex and not fully embedded in strategic planning (Bocken *et al.*, 2019; Troise *et al.*, 2023). In Ireland, this has resulted in a patchwork landscape in which some micro and small enterprises pursue pioneering circular models, while many others view circularity primarily through the lens of compliance or cost saving. Scholars caution that this pattern risks narrowing the transformative potential of the CE, preventing SMEs from capturing the full spectrum of value creation associated with design-led innovation, reverse logistics, industrial networking and regeneration-oriented models (Ünal *et al.*, 2019; Matarazzo *et al.*, 2024).

Looking ahead, the literature suggests a rich horizon of opportunities for SMEs that can broaden their engagement with circularity. For example, advances in digital technologies, from traceability tools and digital product passports to AI-assisted material optimisation, are expected to lower the barriers to implementing more sophisticated circular models (Kirchherr *et al.*, 2018; García-Quevedo *et al.*, 2020).

Sector-specific opportunities are also emerging. For example, Ireland's agrifood sector is using valorisation of biological by-products that offer new avenues for bio-based materials and energy. In the construction sector, circular designs and deconstruction practices align well with national climate and housing priorities (EPA, 2024a). In manufacturing, modularity, repair services and remanufacturing open new value streams while extending product life cycles (EPA, 2024b). Furthermore, growing consumer interest in repair, reuse and sustainability creates market demand for circular products and services that are often best delivered by local SMEs.

The evolving literature suggests that the CE offers SMEs far more than a compliance-driven environmental agenda. Instead, it presents a strategic framework for innovation, resilience and competitiveness – one that becomes increasingly relevant as Ireland accelerates its national circular transition. For Irish SMEs willing to move beyond traditional waste-focused approaches, the CE provides a dynamic space in which new business models, partnerships and technological tools can reshape operational practices and open pathways to long-term value creation.

2 Barriers to and Enablers of Circular Economy Adoption among SMEs

A substantial body of research shows that SMEs face a distinctive set of challenges or barriers when attempting to adopt CE practices. These barriers tend to arise from constraints in resources, capabilities, market structure and institutional environment. Although many Irish SMEs express interest in the CE, empirical studies consistently show that adoption is hindered by internal and external factors (Enterprise Ireland, 2019; OECD, 2022).

2.1 Internal Barriers

A dominant internal barrier concern is limited financial resources, which restricts firms' capacity to invest in redesigning products, upgrading equipment or developing new business models (Rizos *et al.*, 2016; García-Quevedo *et al.*, 2020). This challenge is especially pronounced in micro and small enterprises, which form the majority of the Irish SME base (CSO, 2022). SMEs also often lack technical knowledge and managerial expertise related to CE concepts such as life cycle thinking, resource efficiency and circular design (Prieto-Sandoval *et al.*, 2018). As a consequence, the CE is frequently perceived as complex, high-cost or better suited to larger firms with stronger innovative capabilities. Further research

highlights gaps in strategic orientation, where the CE is not yet integrated into core business planning due to short-term operational pressures (Konietzko *et al.*, 2020). Studies suggest that cultural barriers such as risk aversion, lack of innovation culture, customer demands and a limited entrepreneurial mindset also inhibit the development of CE practices (Suchek *et al.*, 2022; Alcalde-Calonge *et al.*, 2024).

2.2 External Barriers

Externally, SMEs encounter unclear regulatory guidelines, evolving standards and a fragmented policy landscape, which create uncertainty around compliance and investment (OECD, 2022). Additional barriers relate to market conditions: the absence of reliable secondary materials, underdeveloped recycling infrastructure and limited consumer willingness to pay for circular or sustainable products and services (Caldera *et al.*, 2019; Vermunt *et al.*, 2019; García-Quevedo *et al.*, 2020). SMEs also report difficulties forming partnerships for industrial symbiosis or material exchange because of trust issues and a lack of data-sharing mechanisms (Rizos *et al.*, 2016; Arranz *et al.*, 2024). Table 2.1 summarises the barriers faced by SMEs.

Table 2.1. Summary of internal and external barriers to CE adoption among SMEs

Barrier	Description	Key sources
Internal		
Financial constraints	Limited capital for investment in CE technologies, redesign or training	Rizos <i>et al.</i> , 2016; García-Quevedo <i>et al.</i> , 2020
Knowledge and skills deficits	Lack of CE expertise, technical know-how and managerial capacity	Prieto-Sandoval <i>et al.</i> , 2018
Strategic short-termism	CE not prioritised in business strategy due to operational pressures	Konietzko <i>et al.</i> , 2020
Cultural resistance	Risk aversion, preference for established linear practices	Rizos <i>et al.</i> , 2016
External		
Regulatory uncertainty	Confusion about CE-related rules, standards and compliance obligations	OECD, 2022; EPA, 2023
Market limitations	Weak supply of secondary materials, uncertain demand for circular offerings	Kirchherr <i>et al.</i> , 2018; Manninen <i>et al.</i> , 2018
Weak collaboration networks	Difficulty forming CE partnerships or industrial symbiosis	Voulgaridis <i>et al.</i> , 2020

2.3 Internal Enablers

A recurring theme across the literature is the role of leadership commitment in driving CE innovation. SMEs that demonstrate strong owner-manager engagement with sustainability are more likely to explore CE strategies and embed them into their organisational strategies (Koneitzko *et al.*, 2020; Suchek *et al.*, 2024). Leadership often correlates with a broader innovation orientation, enabling firms to adopt circular designs, explore product-service models or collaborate with other businesses across the value chain. Another internal enabler is the development of absorptive capacities, including training, skills development and internal knowledge sharing. Businesses that invest in learning are better positioned to engage with CE tools, standards and metrics (Howard *et al.*, 2022; Yaroson *et al.*, 2024).

2.4 External Enablers

Externally, several structural factors enable CE practices in SMEs (see Table 2.2). One of the major enablers identified in the literature is targeted financial incentives, including grants, tax schemes and innovation vouchers. These incentives help mitigate the perceived risks associated with investment for SMEs (Enterprise Ireland, 2019). Another crucial enabler, as identified in the wider literature, is regulatory measures. Regulatory measures act as positive triggers, especially when policies are stable, transparent and aligned with EU directives on eco-design, extended producer responsibility and waste reduction. Networks, clusters and local partnerships serve as important enablers, facilitating knowledge exchange and fostering trust among firms. Participation in CE platforms or regional hubs increases SMEs' exposure to good practices and can stimulate collaborative resource loops such as shared reuse initiatives or by-product exchanges (Manninen *et al.*, 2018; Voulgaridis *et al.*, 2020).

Table 2.2. Summary of internal and external enablers of CE adoption among SMEs

Enabler	Description	Key sources
Internal		
Leadership commitment	Owner-manager engagement, strategic prioritisation of CE	Konietzko <i>et al.</i> , 2020; Suchek <i>et al.</i> , 2024
Learning and capacity building	Training, CE knowledge development, absorptive capacity	Prieto-Sandoval <i>et al.</i> , 2018
Innovation and digitalisation	Use of digital tools and data systems enabling resource efficiency	OECD, 2022
External		
Financial incentives	Grants, funding and support schemes that lower transition costs	Enterprise Ireland, 2019
Regulatory clarity EU directives	Predictable CE-aligned policies supporting long-term planning Industrial symbiosis, CE hubs, knowledge exchange platforms	European Commission, 2020 Manninen <i>et al.</i> , 2018; Voulgaridis <i>et al.</i> , 2020

3 Micro-enablers

3.1 Overview

Research on CE adoption by SMEs has traditionally centred on identifying barriers. While this body of work is valuable, it has resulted in an analytical imbalance. Far less attention has been paid to the factors that enable SMEs to engage in circular practices. As a result, the current evidence base often presents an incomplete picture of SME behaviour, emphasising obstacles rather than the practical conditions that can support change.

Compared with barriers, enablers remain underexplored and under-documented in both academic and policy literature. Existing studies typically discuss high-level, well-recognised enablers (as discussed in Chapter 2) such as government grants, regulatory clarity and access to knowledge. However, these macro-level drivers do not fully explain how SMEs begin to experiment with circular practices in everyday operations. Critically, they do not capture the more subtle, ground-level factors that quietly influence SME behaviour, which are often embedded in routine decision-making, workplace relationships and informal networks. In this project, we have given these factors the name “micro-enablers” or “hidden enablers”.

3.2 The Concept of Micro-enablers or Hidden Enablers

In this project, the under-recognised drivers are conceptualised as micro-enablers or hidden enablers. Micro-enablers refer to small, often overlooked conditions that make circular practices easier, more attractive or more feasible for SMEs. They may arise from organisational culture, employee initiative, internal champions, existing resource flows, informal collaborations, operational routines or accumulated tacit knowledge (Holzer *et al.*, 2021; Findik *et al.*, 2023).

These micro-enablers frequently operate beneath the radar of formal policy discussions. For example, an employee with repair skills, a pre-existing relationship with a local recycler or a manager’s preference

for avoiding waste can meaningfully influence CE adoption, but these factors rarely appear in formal CE assessments. Though subtle, micro-enablers can act as catalysts that unlock early experimentation, helping SMEs take their first steps towards reuse, redesign or resource efficiency. These enabling conditions are seldom documented because they do not fit neatly into established reporting categories. They are often context-specific, informal and intertwined with day-to-day operations. As a result, micro-enablers or hidden enablers:

- are rarely captured in surveys or high-level evaluations;
- are often invisible to SMEs themselves, who may not identify them explicitly, viewing them simply as “how we do things”;
- can be taken for granted and thus easily overlooked in research focused on more visible structural barriers;
- vary significantly across sectors and firm sizes, further complicating their recognition.

Given their subtle nature and limited documentation, micro-enablers require new methodological approaches to be visible. Traditional top-down analyses are insufficient for capturing everyday operational realities within SMEs. We adopt an approach that:

- engages SMEs directly to uncover practical, context-specific enablers;
- uses bottom-up qualitative insights to complement existing quantitative frameworks;
- focuses on lived experiences, informal practices and real-world problem-solving;
- seeks to map not only *what* SMEs do, but *how* and *why* certain actions become possible.

By centring on these micro-enablers, the aim is to broaden the understanding of what truly influences CE engagement. Rather than focusing solely on barriers, this approach identifies the often overlooked conditions that, once recognised, can be strengthened, scaled or replicated to improve CE engagement.

4 Our Survey of SMEs in Ireland

During our research, we employed a structured survey to investigate the adoption of CE practices in Irish SMEs. The survey development process began with a comprehensive literature review, which identified key themes, barriers and enablers associated with CE adoption in SMEs. This review provided the theoretical foundation for the subsequent stages of survey design and ensured that the instrument was grounded in existing empirical and conceptual knowledge.

Following the literature review, two participatory online workshops were conducted with SME owners and managers to co-create the survey content. The first workshop ($n = 15$) focused on gathering experiential insights from participants regarding the current challenges, opportunities and overall engagement with CE practices in their businesses. Prompts were used to elicit detailed discussions, which informed the preliminary structure and content of the survey. The second workshop ($n = 12$) was built on these findings by exploring enablers of CE adoption in greater depth and facilitating an initial pilot test of the survey instrument. Feedback from this workshop enabled refinement of question phrasing and ensured the survey was both comprehensible and contextually

relevant. A prototype of the survey was subsequently developed and reviewed by the EPA steering group committee, which provided expert validation of the content, format and alignment with the project objectives. Ethical approval for the study was obtained prior to deployment, ensuring compliance with research ethics standards, including informed consent, anonymity and data protection.

The final survey was deployed online using the Qualtrics platform. To maximise engagement and reach, the survey was disseminated through multiple channels: via professional networks, such as the project's LinkedIn page and the researchers' personal LinkedIn networks, and direct emails to the local enterprise offices across counties in Ireland. These channels facilitated engagement with a diverse sample of SMEs, encompassing different sectors and sizes. The survey was accessible from October 2025 to November 2025. A total of 89 responses were collected in the survey. After cleaning the data and removing unfinished responses and outliers, 71 responses were deemed acceptable for analysis. Figure 4.1 presents the methodological process used in the research.

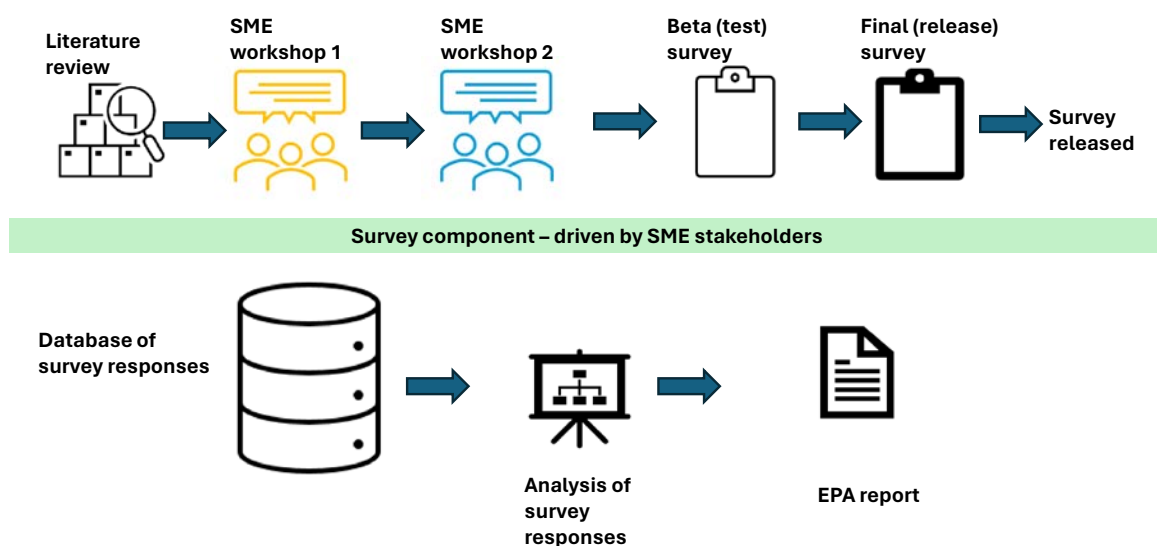


Figure 4.1. Methodological process.

5 Analysis of Survey Results

This chapter presents the analysis of survey findings on SMEs' engagement with the CE. It begins with descriptive statistics, followed by an examination of CE understanding, key challenges, levels of knowledge and awareness, and the availability of resources and capabilities. The analysis then explores organisational culture and mindset, the role of technology and infrastructure, and circular practices, before concluding with an assessment of the key enablers influencing CE adoption.

5.1 Sample Overview

The sample represents a broad mix of SMEs, with respondents distributed across multiple sectors, as represented in Figure 5.1. To contextualise the findings, it is important to consider the sectoral composition of the sample in relation to the wider SME population. While Irish SMEs are spread across a diverse range of sectors, the survey achieved particularly strong participation from firms operating in retail, manufacturing, wholesale and hospitality-related activities. Retail accounted for the largest share of respondents ($n=20$; 28.2%), followed by manufacturing ($n=14$; 19.7%), travel,

accommodation and food services ($n=12$; 16.9%) and wholesale ($n=10$; 14.1%). Construction represented 9.9% of the sample ($n=7$), while electronics, IT and telecommunications accounted for 4.2% ($n=3$). The remaining respondents were drawn from pharmaceuticals, financial services, professional services, real estate and insurance, with each sector represented by one respondent (1.4%). Although these sectors are represented in the analysis, their small sample sizes mean that findings should be interpreted with caution when considering sector-specific conclusions.

The customer base profile further reflects the diversity of market orientations within the sample. Business-to-consumer (B2C)-oriented firms formed the largest group (50.7%), while 31.0% of SMEs served both business and individual customers (business-to-business (B2B) and B2C) and 18.3% operated solely in B2B markets (see Figure 5.2). This diversity is important because market structure strongly influences sustainability pressures and CE adoption: B2C firms may respond more directly to consumer expectations of environmentally responsible practices, whereas B2B firms may be influenced by supply chain requirements or client-driven sustainability standards.

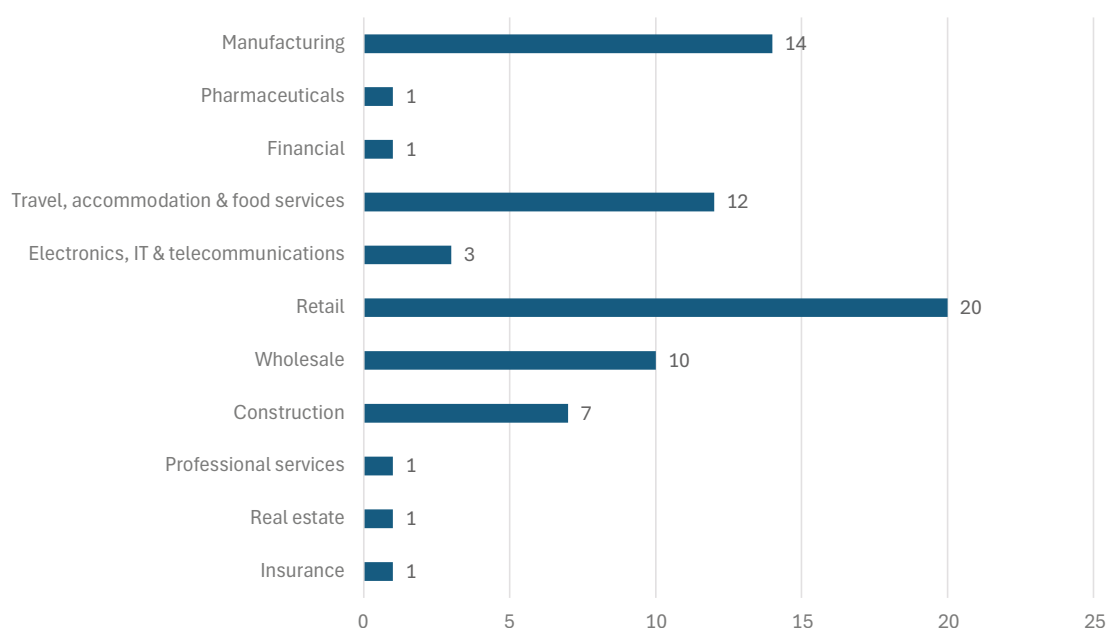


Figure 5.1. SME sectors represented in our survey responses (number of respondents).

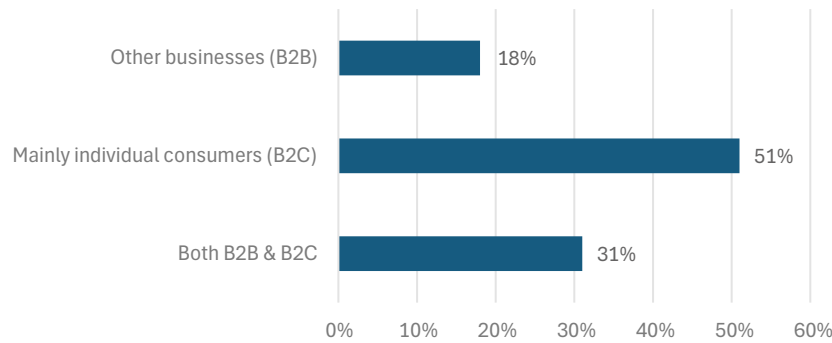


Figure 5.2. B2B and B2C SMEs in our sample.

The respondents were asked to indicate the extent to which they felt positive about their company's current approach or integration of CE practices and/or circular business models. The results indicate that a substantial proportion of respondents (64.8%) expressed a positive perception of their company's CE initiatives. A smaller proportion of respondents (32.4%) expressed a negative perception, while only 2.8% were neutral.

5.2 Identified Challenges

Across sectors, respondents highlighted a diverse but often overlapping set of challenges in adopting CE practices (Figure 5.3). Retail, manufacturing, and travel, accommodation and food services were the most represented sectors, allowing for richer insights

into their challenge profiles. The manufacturing sector ($n=14$) reported multiple concurrent barriers, with high upfront costs ($n=12$; 86%) emerging as the most frequently selected challenge. Quality issues ($n=10$; 71%), lack of clear guidelines ($n=9$; 64%) and time-consuming processes ($n=9$; 64%) were also commonly reported, reflecting operational and resource-intensive constraints associated with production-based circular transitions. Supply chain complexity ($n=8$; 57%) and lack of customer demand ($n=8$; 57%) further highlight structural and market-related pressures within the sector.

The retail sector ($n=20$), representing the largest group in the sample, reported a particularly broad range of barriers. High upfront costs and lack of financial resources were each selected by

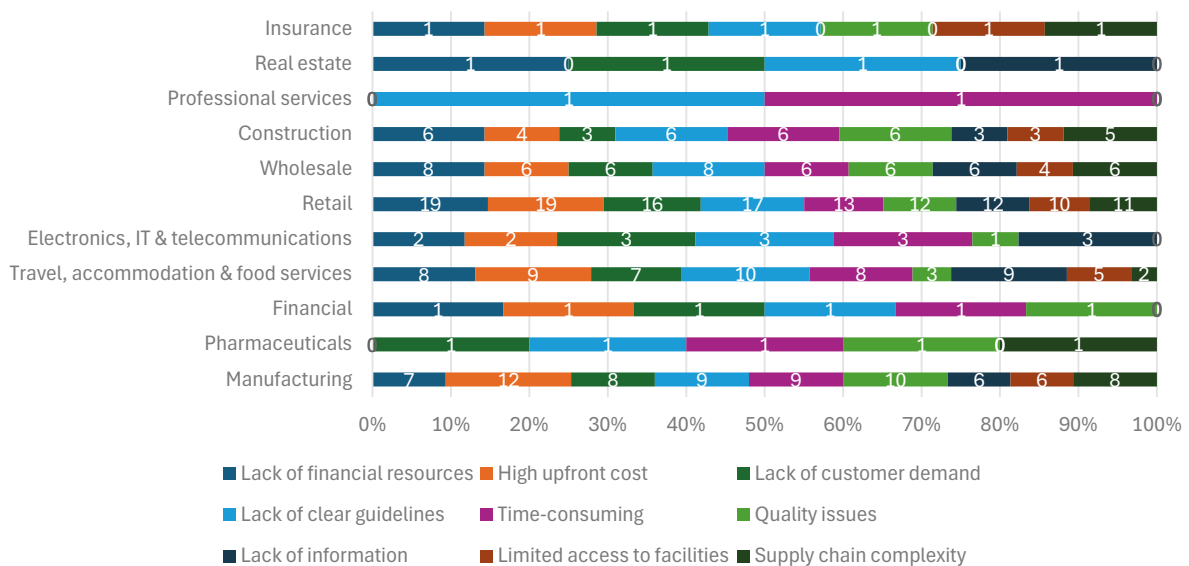


Figure 5.3. Specific challenges identified by SMEs (unweighted data). Percentages are based on unweighted survey responses. Sector sample sizes vary considerably, with some sectors represented by a single respondent; therefore, sector-level comparisons should be interpreted with caution.

19 respondents (95%), indicating strong financial constraints. Lack of clear guidelines ($n=17$; 85%) and lack of customer demand ($n=16$; 80%) were also highly prevalent, suggesting uncertainty in both regulatory direction and market uptake of CE-aligned products. In addition, respondents reported limited access to facilities ($n=10$; 50%) and supply chain complexity ($n=11$; 55%), highlighting structural challenges in adapting existing retail systems.

Responses from travel, accommodation and food services businesses ($n=12$) indicated that lack of clear guidelines ($n=10$; 83%) and lack of information ($n=9$; 75%) were the most frequently selected barriers. High upfront costs ($n=9$; 75%) and lack of financial resources ($n=8$; 67%) were also prominent, alongside time-consuming processes ($n=8$; 67%). Customer demand constraints ($n=7$; 58%) and limited access to facilities ($n=5$; 42%) further reflect the combined operational and regulatory pressures faced by service-oriented firms.

The wholesale sector ($n=10$) reported consistently high levels of barriers across multiple categories. Lack of financial resources and lack of clear guidelines were each selected by eight respondents (80%). High upfront costs ($n=6$; 60%), time-consuming processes ($n=6$; 60%), quality issues ($n=6$; 60%), lack of information ($n=6$; 60%) and supply chain complexity ($n=6$; 60%) were also frequently reported, indicating widespread perceived constraints across financial, informational and operational dimensions.

Construction firms ($n=7$) similarly reported multiple overlapping barriers, particularly lack of financial resources ($n=6$; 86%), lack of clear guidelines ($n=6$; 86%), time-consuming processes ($n=6$; 86%) and quality issues ($n=6$; 86%). Supply chain complexity ($n=5$; 71%) and high upfront costs ($n=4$; 57%) were also prominent, reflecting the project-based and fragmented nature of the industry.

Other sectors, including electronics, IT and telecommunications, financial services, pharmaceuticals, insurance, real estate and professional services ($n \leq 3$ per sector), exhibited more limited and less generalisable patterns due to small sample sizes. Nonetheless, some recurring barriers were observed, particularly around unclear guidelines, time requirements and upfront costs. These findings should be interpreted cautiously given the limited number of respondents per sector.

Overall, the analysis indicates that, while financial constraints, in particular high upfront costs and lack of financial resources, are consistently reported across sectors, the nature and combination of other barriers vary according to sectoral context. The manufacturing and retail sectors exhibit broad, multidimensional constraint profiles, whereas service-oriented sectors place greater emphasis on informational and regulatory barriers. This sectoral differentiation highlights the importance of tailored CE policy and support mechanisms rather than uniform, one-size-fits-all approaches.

5.3 Knowledge and Awareness

The results indicate that SMEs have varying levels of awareness and knowledge related to CE practices (Figure 5.4). Across the statements, between 52.1% and 76.1% of respondents agreed or strongly agreed that their company faces knowledge- or awareness-related challenges. More than half of respondents (54.9%) agreed that their company lacks sufficient knowledge about CE practices, while 57.7% reported limited understanding of CE-related regulations and standards. Similarly, 63.4% agreed that there is limited awareness of the potential business benefits of the CE, and 52.1% indicated that employees are not aware of how circular practices could benefit the business.

However, a substantial proportion of respondents disagreed with some of these statements. For example, 39.4% disagreed that their company lacks sufficient CE knowledge, with many expressing uncertainty regarding the relevance of the CE to their own organisation. In particular, 76.1% agreed or strongly agreed that, while the potential benefits of the CE are generally understood, the specific benefits for their company remain unclear. This suggests that, despite a general awareness of CE concepts, many SMEs struggle to translate these concepts into a clear and actionable business case.

5.4 Resources and Capabilities

The survey findings highlight that internal resources and organisational capabilities are critical determinants of SMEs' engagement with CE practices (Figure 5.5). Limited financial resources were identified as a notable constraint, with 38% of respondents agreeing

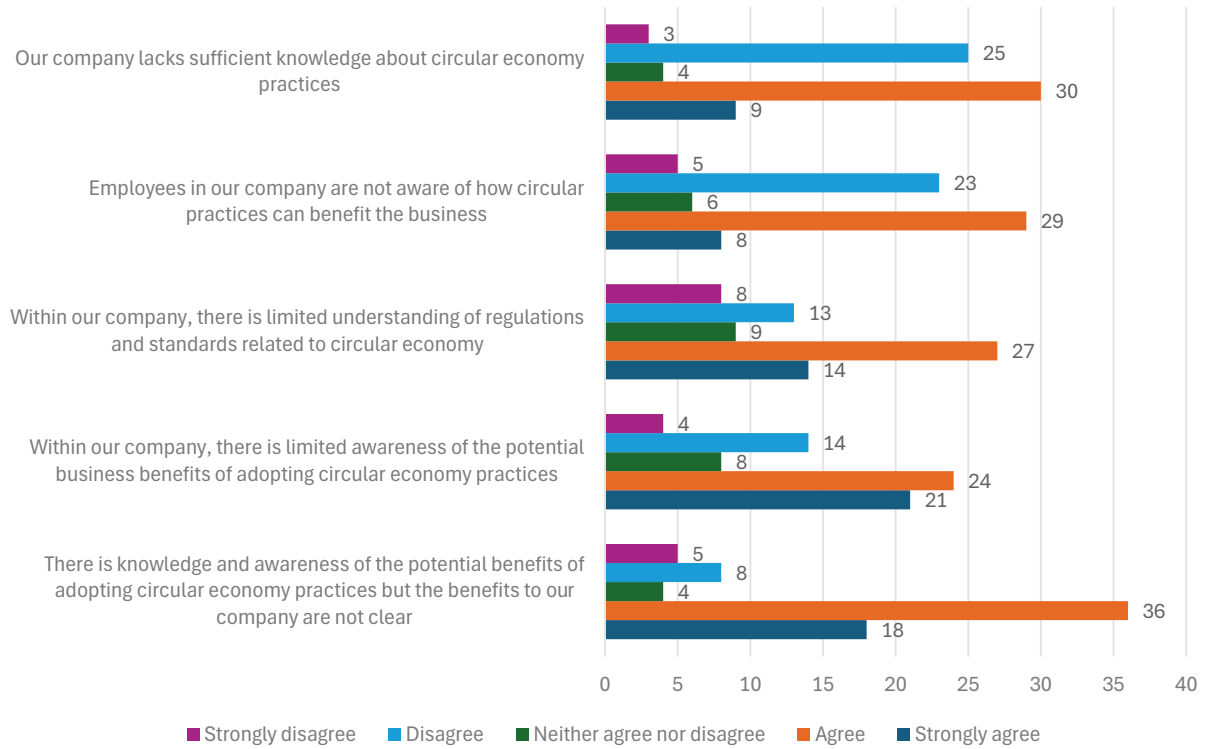


Figure 5.4. SMEs' ratings of CE knowledge and awareness (number of respondents).

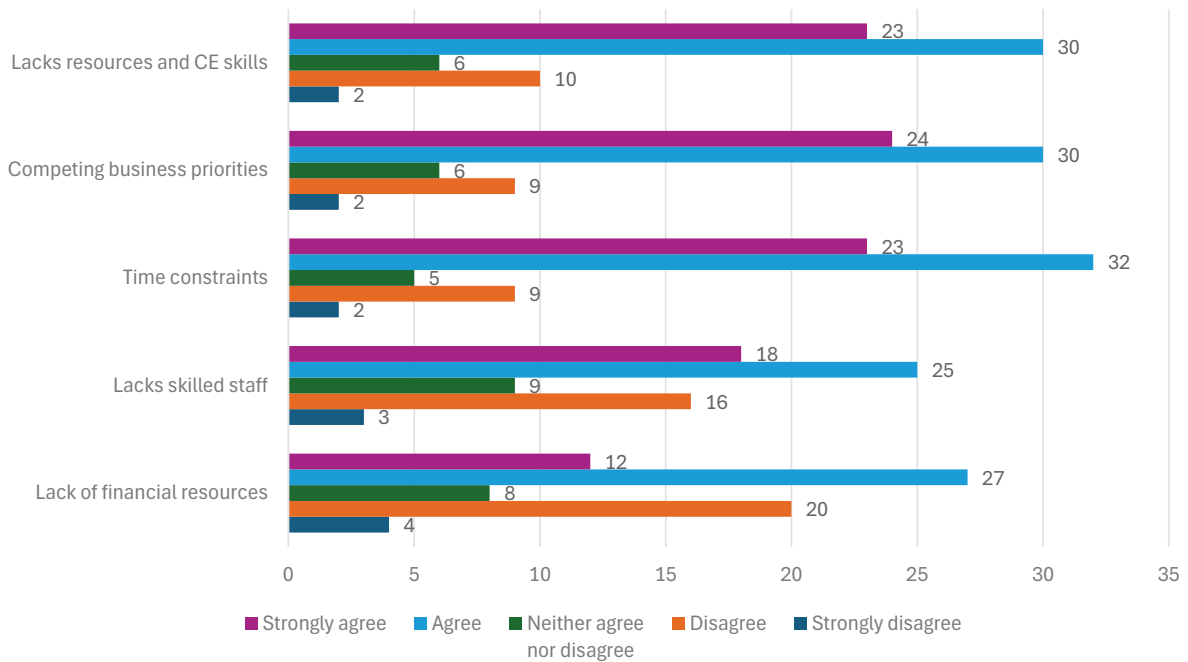


Figure 5.5. SMEs' ratings of resources and capabilities (number of respondents).

and 17% strongly agreeing that their companies lack the necessary funds to implement circular practices, suggesting that capital availability directly influences the feasibility of CE initiatives. Similarly, a shortage of skilled staff emerged as a key barrier, with 35% agreeing and 25% strongly agreeing that

insufficient expertise hampers the management and operationalisation of CE initiatives, reflecting the need for targeted skills development and training. Time constraints were also prominent, as 45% agreed and 32% strongly agreed that limited time prevents participation in CE activities, while 42%

agreed and 34% strongly agreed that competing business priorities were a limiting factor, indicating that strategic alignment and internal prioritisation are essential to facilitate CE integration. Notably, respondents recognised the potential value of enhanced resources and specialised skills, with 42% agreeing and 32% strongly agreeing that greater capacity would enable more effective engagement in circular practices, emphasising that investment in both financial and human capital could substantially strengthen SMEs' CE capabilities. Collectively, these findings underscore that, while SMEs acknowledge the strategic importance of circular practices, resource and capability constraints continue to limit their adoption, suggesting that interventions aimed at financial support, skills development and operational flexibility could play a pivotal role in advancing CE uptake.

5.5 Organisational Culture and Mindset

The survey results suggest that organisational culture and mindset significantly influence SMEs' engagement with CE practices (Figure 5.6). A considerable proportion of respondents indicated that their companies face cultural and strategic barriers. For example, 48% agreed and 14% strongly agreed that management prioritises short-term profit over sustainability, highlighting a tension between immediate business goals and long-term circular

ambitions. Employee resistance to change was reported, with 56% agreeing and 17% strongly agreeing that such resistance is present in their organisation, suggesting that behavioural and attitudinal factors may impede the adoption of circular practices. Risk aversion also emerged as a barrier, with 49% agreeing and 25% strongly agreeing that cautious approaches limit experimentation with new CE practices. Furthermore, 31% agreed and 34% strongly agreed that there is an absence of explicit CE objectives within the business strategy, while 35% agreed and 44% strongly agreed that leadership support for CE initiatives is lacking. Collectively, these findings indicate that SMEs' cultural orientation, leadership priorities and employee mindset can constrain the integration of circular practices, emphasising the need for strategic embedding of sustainability objectives, proactive leadership and change management to foster a more supportive organisational environment for CE adoption.

5.6 Technology and Infrastructure

The survey results indicate that technology and infrastructure represent key enablers of or barriers to the adoption of CE practices in SMEs (Figure 5.7). Around 41% of respondents agreed and 17% strongly agreed that their businesses lack access to suitable technologies or infrastructure to implement circular practices, while 28% disagreed and 6% strongly disagreed

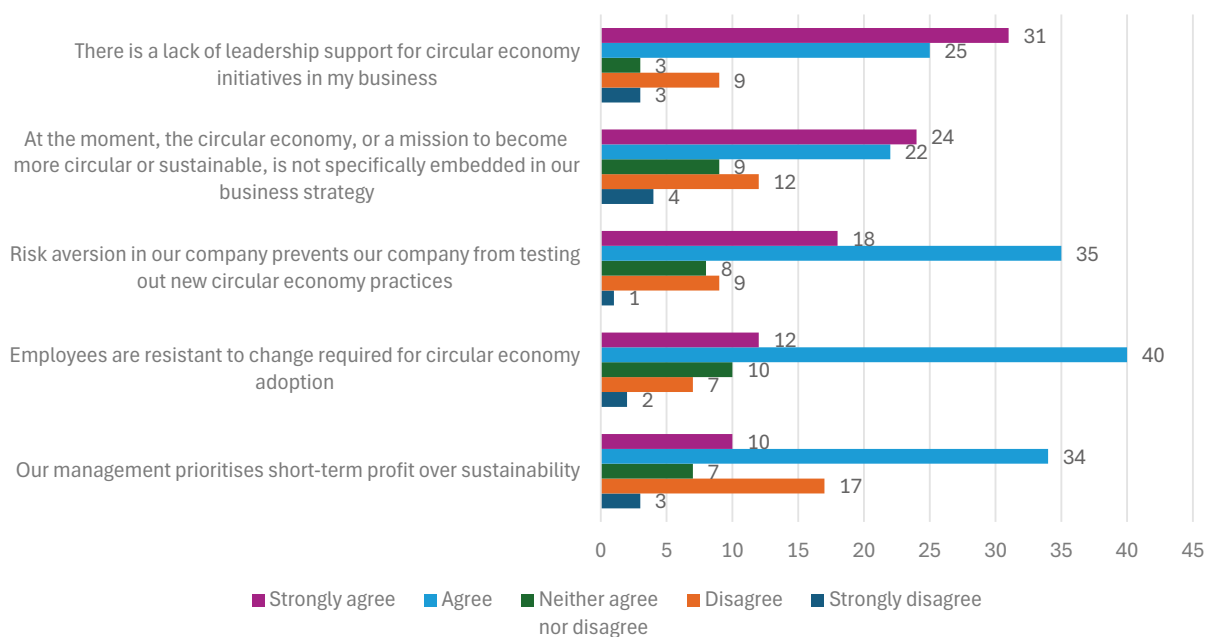


Figure 5.6. SMEs' ratings of organisational culture and mindset (number of respondents).

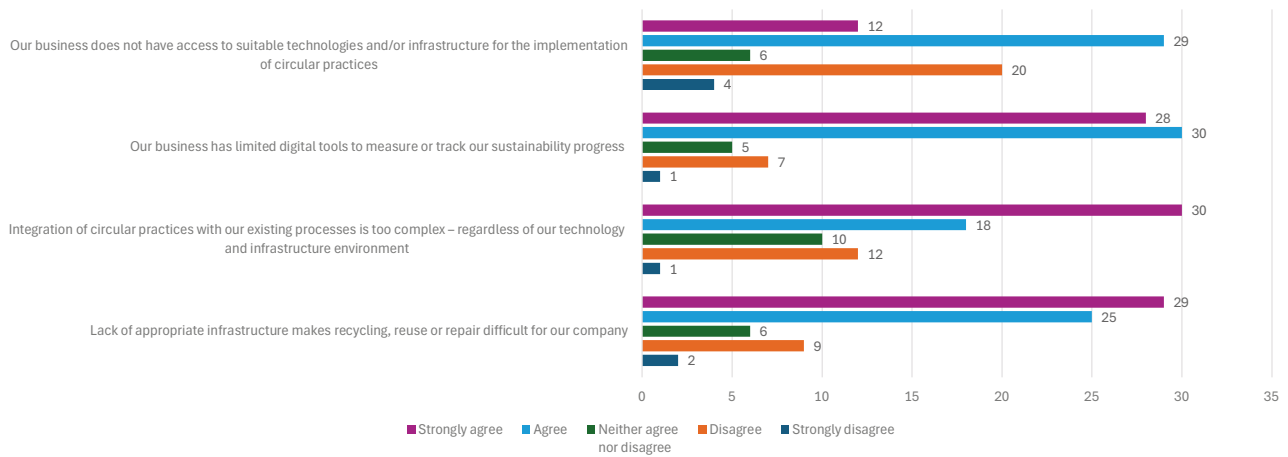


Figure 5.7. SMEs' ratings of technology and infrastructure (number of respondents).

disagreed. Limited digital tools for measuring or tracking sustainability progress were reported as a significant constraint, with 42% agreeing and 39% strongly agreeing that this was a factor for their organisation, highlighting gaps in monitoring and performance management capabilities. Integration of circular practices into existing processes was perceived as complex, with 25% agreeing and 42% strongly agreeing, suggesting that technological and process-related challenges can hinder operational adoption of CE initiatives. Furthermore, 35% agreed and 41% strongly agreed that infrastructure limitations impacting recycling, reuse and repair activities are a problem, emphasising practical barriers to circular operations. Overall, these findings underscore that, while SMEs recognise the strategic importance of the CE, inadequate technological capacity and

infrastructure complexity can substantially limit their ability to implement circular practices, pointing to a need for targeted support, digital solutions and process integration strategies.

5.7 Circular Practices

The survey findings indicate that SMEs are selectively engaging in CE practices, with a stronger emphasis on operational and process-focused initiatives than on strategic or customer-oriented activities (Figure 5.8). Adoption of resource efficiency measures, such as reducing energy, water or raw material use, was reported as somewhat likely by 48% of respondents and very likely by 32%, while systematic separation and recycling of waste streams was considered somewhat likely by 49% and very likely by 38%.

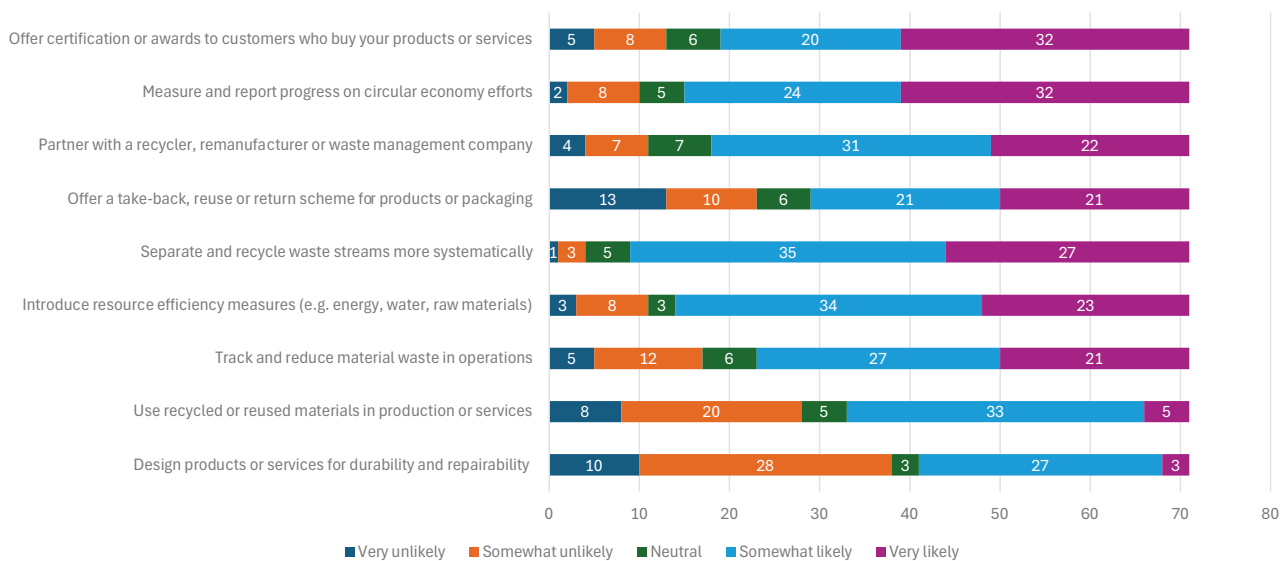


Figure 5.8. SMEs' preferred CE practices for implementation (number of respondents).

Similarly, tracking and reducing material waste was rated as a likely action by a majority of respondents (38% somewhat likely, 30% very likely), reflecting an awareness of efficiency gains and cost savings as primary motivators for CE adoption.

In contrast, practices requiring product redesign, innovation or customer engagement are less prevalent. Designing products or services for durability and repairability was considered somewhat likely by 38% and very likely by only 4% of respondents, suggesting that SMEs face challenges in integrating circularity into product development. Take-back, reuse or return schemes also show limited uptake (30% somewhat likely, 30% very likely), as do initiatives to use recycled or reused materials (33% somewhat likely, 5% very likely) or to partner with recyclers and remanufacturers (44% somewhat likely, 31% very likely). Reporting and formal recognition of CE efforts through measurement, reporting or customer certifications show moderate engagement, with 34% of SMEs being somewhat likely and 45% very likely to measure progress, and 28% somewhat likely and 45% very likely to offer awards or certifications.

Overall, these findings suggest that SMEs tend to prioritise CE practices that are operationally manageable and directly linked to efficiency and cost savings, while more strategic, innovative or externally focused practices such as product redesign, customer engagement and formal reporting are less frequently implemented. This indicates both a potential area for targeted support and an opportunity to embed circularity more systematically into business models,

moving beyond incremental operational changes to more transformative CE initiatives.

5.8 Enablers of Circular Practices among SMEs

Understanding the factors that facilitate the adoption of CE practices is critical for developing effective interventions targeted at SMEs. To investigate this, respondents were asked to indicate the perceived likelihood of various enablers supporting CE implementation, using a five-point Likert scale ranging from “very unlikely” to “very likely”. Figure 5.9 depicts the various enablers of CE practices. Financial support, such as access to grants, subsidies or low-interest loans, was perceived as likely to enable CE adoption by 85% of respondents. Local infrastructure, including collection points, recycling facilities and logistics support, was considered highly influential, with 94% of SMEs rating it as likely to facilitate circular practices. Similarly, tax incentives, including reduced taxes or credits for CE initiatives, were regarded as important by 87% of respondents.

Technical support and training, encompassing workshops, consultancy and step-by-step guidance, was viewed as a likely enabler by 90% of SMEs, matching the perceived importance of affordable technology, which was rated positively by 90% of respondents. The availability of a skilled workforce, through either hiring or training staff with relevant technical knowledge, was also seen as critical, with 85% of respondents indicating its importance.

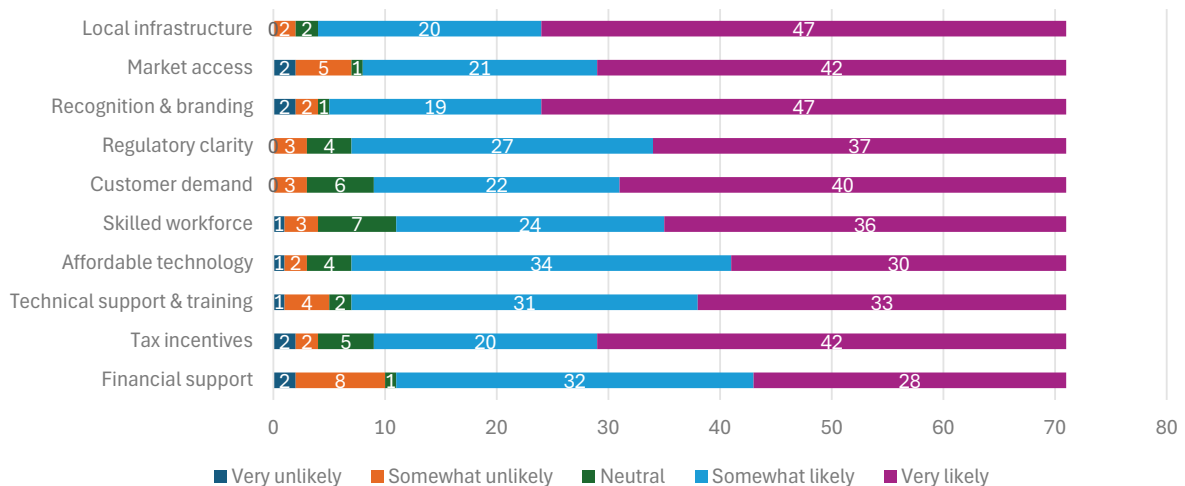


Figure 5.9. Enablers as identified by SMEs (number of respondents).

Market- and policy-oriented factors were similarly significant. Customer demand for sustainable or circular products was perceived as a likely enabler by 87% of SMEs, while regulatory clarity, including transparent rules and standards, was rated positively by 90% of respondents. Finally, recognition

and branding, such as certifications and public acknowledgement, and market access, such as easier access to buyers prioritising circular products, were seen as likely enablers by 93% and 89% of respondents, respectively.

6 Case Study: Forest Living

CE principles are increasingly relevant for SMEs, emphasising resource efficiency, waste reduction and sustainable product design. This report presents the experience of Conor Fay, a seventh generation woodworker, in embedding CE practices within the family business (The Carpentry Store) and establishing the start-up Forest Living. The case highlights the enablers that facilitated CE adoption, providing practical insights for SMEs.

It was a recognition of the increasing relevance of CE principles for SMEs that prompted Conor to found Forest Living, a start-up transforming sawdust waste into sustainable homeware products such as coasters, placemats and tea light holders. Central to the innovation was the use of mycelium (the root system of mushrooms) as a natural binding agent. According to Conor, “the use of a natural binding agent allows the product to be fully biodegradable and lends itself perfectly to the circular economy by not contaminating any resources with complex materials that can’t be separated at the end of their lives”. The process involves moistening and sterilising sawdust, inoculating it with mycelium, allowing the mixture to mature and finally drying it. This creates a solid, mouldable and biodegradable material suitable for consumer products and potentially larger applications such as furniture panels.

6.1 Enablers Identified from the Case Study

Key lessons learned from the Forest Living case study are presented in Table 6.1. This table demonstrates that Conor Fay’s journey with Forest Living illustrates several key enablers that facilitated the successful adoption of CE practices within a traditional SME context. These enablers span personal capabilities, organisational resources, external support and market alignment.

6.2 Translating Insights into Action: Guidance for SMEs

The survey analysis provides a broad understanding of how SMEs engage with the CE, highlighting key

challenges, key enablers and the practices most likely to be adopted. To complement these findings, the case study of Conor Fay and Forest Living offers a detailed look at the practical experience of implementing CE practices within an SME. Drawing on both the survey and the case study, a roadmap is presented to guide SMEs in translating CE concepts into actionable steps. This roadmap distils lessons learned, best practices and targeted guidance to help SMEs overcome barriers, leverage enablers and systematically integrate CE initiatives into their operations.

The experience of Conor Fay and Forest Living offers valuable lessons for SMEs seeking to adopt CE principles. While each business operates within a unique context, certain key enablers, ranging from technical expertise and entrepreneurial vision to external support and market awareness, consistently facilitate successful CE implementation. Figure 6.1 illustrates the following guidance, outlining practical actions that any SME can take to integrate circular practices into their operations.

1. Assess internal capabilities

SMEs should begin by mapping existing resources, skills and knowledge to identify potential waste streams or by-products that could be repurposed. Engaging staff in the identification of opportunities and evaluating technical feasibility ensures that CE initiatives are grounded in practical, internal strengths.

2. Develop a circular vision

Establishing a clear sustainability vision helps SMEs align organisational priorities and communicate the overall purpose to employees and stakeholders. By integrating CE objectives into their business strategies, SMEs can create a framework for decision-making that consistently considers environmental, social and economic outcomes.

3. Implement a research-driven approach

CE initiatives should be approached systematically, with small-scale trials, experimentation and continuous learning.

Table 6.1. Key lessons from the Forest Living case study

Enabler	Description/evidence from case study	In-depth advice for SMEs
Technology and skills	Conor's extensive knowledge of timber and woodworking provided a strong foundation for innovation. His familiarity with wood production processes enabled him to recognise the value of sawdust as a raw material rather than waste: "I grew up around timber and wood machinery and have an in-depth knowledge of the industry."	Assess internal technical skills and industry knowledge to identify underutilised materials. Map resources in operations and explore ways to repurpose them sustainably. Train staff in CE principles to strengthen internal capability.
Resources, capabilities and organisational culture	A strong personal commitment to resource efficiency and sustainability motivated Conor to explore alternative uses for sawdust. This vision was central to transforming a waste problem into a business opportunity.	Cultivate a culture connecting sustainability with innovation. Set strategic goals for CE initiatives and encourage employee-driven ideas. Clearly articulate a sustainability vision to align organisational efforts.
Collaboration and time	Conor invested significant time in exploring academic studies, industry practices and practical trials to identify feasible methods for converting sawdust into valuable products: "I spent a huge amount of time on research, sieving through countless articles about sawdust and looking at the findings from universities doing experiments with mycelium."	Implement structured experimentation through pilot projects and small-scale trials. Collaborate with universities or research institutions. Document results and iterate systematically to refine solutions.
Business knowledge and skills	Conor's master's in business management equipped him with strategic, research and planning skills to complement technical expertise.	Pair technical innovation with business planning. Understand market demand, cost structures and scalability. Invest in CE-focused training or mentorship programmes to strengthen strategic decision-making.
Institutional support and collaboration	Engagement with Enterprise Ireland, Trinity College Dublin, the New Frontiers programme and the Kildare Local Enterprise Office provided funding, technical validation and guidance, which reduced risk and facilitated product development: "The New Frontiers programme and the Kildare LEO [Local Enterprise Office] have been invaluable ... I feel I've been well supported throughout my entire journey."	Explore external resources such as grants, innovation vouchers, enterprise programmes and academic partnerships. Early engagement provides financial support, technical guidance and credibility.
Iterative learning and adaptability	Conor embraced trial-and-error experimentation, adapting his approach based on technical challenges and market feedback. Learning from failure was essential for refining both product and process: "The hardest part ... has probably been accepting failure and learning to know when something isn't going to work and then finding a solution or an alternative."	Foster a culture of experimentation and resilience. Normalise failure as a learning tool, implement feedback loops and continuously improve CE practices.
Market awareness and timing	Strategic alignment of product launch with trade fairs and the launch of the e-commerce site ensured market readiness and visibility, enhancing the commercial viability of the circular products.	Align CE initiatives with market demand. Conduct research on customer needs, product applications and pricing. Plan product launches and distribution strategically to ensure commercial viability.

SMEs can draw on industry literature, case studies and partnerships with research institutions to inform decisions, reduce risk and validate innovative solutions before scaling them.

4. Combine technical innovation with business planning

Innovation must be complemented by an understanding of market demand, cost implications and scalability. Integrating CE principles into business planning ensures that CE initiatives are commercially viable,

financially sustainable and aligned with long-term business goals.

5. Leverage external support networks

SMEs can benefit from grants, enterprise programmes, innovation vouchers and university or industry collaborations. Engaging with external support structures early in the process provides financial resources, technical guidance and networking opportunities that can accelerate the adoption of circular practices.

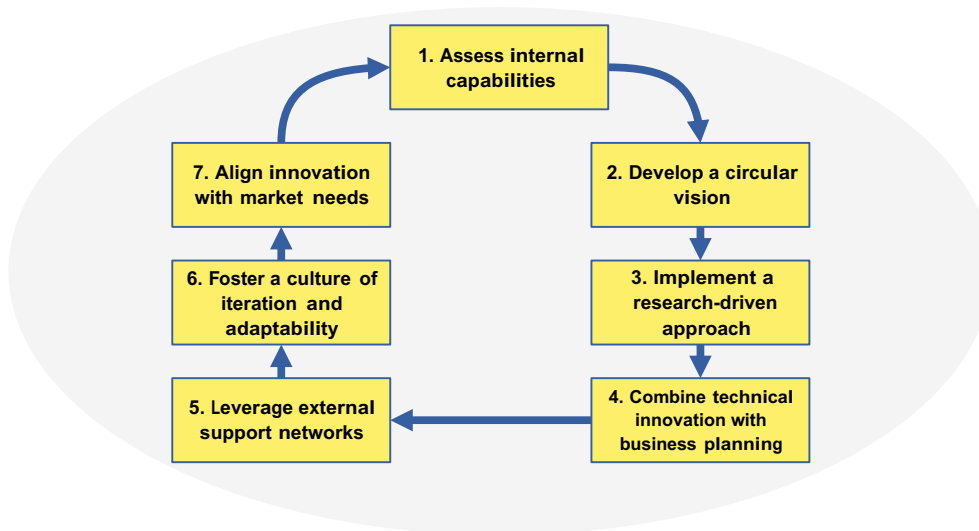


Figure 6.1. Roadmap for CE transition.

6. Foster a culture of iteration and adaptability

CE initiatives often involve trial and error. SMEs should normalise experimentation, accept occasional failure and establish feedback mechanisms to refine processes and products. Documenting lessons learned promotes continuous improvement and builds organisational resilience.

7. Align innovation with market needs

The success of CE initiatives depends on market acceptance. SMEs should conduct market research, assess customer needs and consider pricing and distribution strategies when introducing circular products or services. Aligning innovation with market demand ensures that sustainability efforts also deliver commercial impact.

7 Conclusions and Future Work

7.1 Main Outcomes

Our project provides insights into the factors perceived by SMEs as critical enablers for adopting CE practices. Survey results indicate that SMEs consider a diverse set of enablers spanning financial, technical, human, regulatory and market dimensions. Specifically, financial support, such as access to grants, subsidies or low-interest loans, was rated as likely to facilitate CE adoption by 85% of respondents, highlighting the persistent importance of addressing upfront investment barriers. Similarly, the availability of local infrastructure, including collection points, recycling facilities and logistics support, was perceived as likely to support CE practices by 94% of SMEs, indicating that physical and operational enablers are fundamental for circular transitions.

Tax incentives were also considered important, with 87% of respondents indicating that reduced taxes or credits for implementing circular practices would be likely to encourage adoption. This underscores the role of fiscal policies as motivators for SMEs, which often operate with limited financial flexibility. Beyond financial and structural factors, technical support and training were viewed as crucial enablers by 90% of SMEs, highlighting the need for accessible knowledge, consultancy and step-by-step guidance. Affordable technology was rated similarly by 90% of respondents, indicating that SMEs value cost-effective tools and machinery that can facilitate CE processes.

Human resources capacity emerged as a key internal factor, with 85% of respondents identifying building a skilled workforce through hiring or staff training as likely to support CE adoption. Market-oriented and external regulatory factors were also highly influential. Clear customer demand for sustainable or circular products was viewed as a significant enabler by 87% of respondents, while regulatory clarity, including transparent rules, standards and compliance requirements, was rated positively by 90%. Finally, recognition and branding mechanisms, such as certifications and public acknowledgement, and market access opportunities were considered likely enablers by 93% and 89% of respondents,

respectively. These findings collectively suggest that SMEs require a coordinated approach that integrates financial incentives, technical capacity building, workforce development, regulatory guidance, market signals and reputational benefits to successfully adopt CE practices.

7.2 Overall Contribution to Knowledge

Our research makes several notable contributions to the knowledge on CE adoption, particularly in the following contexts:

- **A more holistic understanding of CE enablers for SMEs has been developed.** By empirically examining a comprehensive set of enablers, the research highlights that SMEs do not rely solely on financial mechanisms. Technical support, workforce capability, market demand and recognition mechanisms are equally critical, providing a more nuanced understanding of the multidimensional drivers of CE adoption.
- **We have obtained quantitative evidence from SMEs in a bottom-up manner.** While much CE research has focused on large enterprises or theoretical frameworks, this study provides quantitative evidence directly from SMEs, filling a notable gap in empirical research (Tritto *et al.*, 2024; Ahmadov *et al.*, 2025). The results offer robust data on SMEs' perceptions of enablers, facilitating sectoral comparisons across financial, technical, human, regulatory and market dimensions.
- **We have examined the integration of internal and external factors.** The study highlights the interaction between internal capabilities (e.g. technical knowledge, workforce skills) and external signals (e.g. regulatory clarity, customer demand), advancing theoretical understanding of the conditions under which SMEs are likely to implement circular practices. This contributes to a more integrated model of CE adoption that accounts for both firm-level capacity and external environmental pressures.

- **Understanding policy and practice implications.** By quantifying SMEs' perceptions of enablers, the research provides actionable insights for policymakers, industry associations and support organisations. It demonstrates the need for multidimensional interventions rather than isolated measures and offers guidance on which enablers may have the greatest impact in encouraging CE uptake among SMEs.

7.3 Practical Takeaways for SMEs

The key takeaways for SMEs are as follows:

- SMEs should adopt a **multifaceted strategy** for CE adoption that combines financial planning, investment in technical capacity, workforce development and market engagement. Addressing multiple enablers simultaneously will increase the likelihood of successful implementation.
- SMEs will need to direct attention to **market signals**, including customer demand for sustainable products, recognition opportunities and access to buyers interested in circular products. Such signals can enhance the business case for circular practices. SMEs can leverage these signals to align CE initiatives with market opportunities and build a competitive advantage.
- Leveraging available **support infrastructure and affordable technology** can reduce operational barriers. SMEs are encouraged to make use of local recycling or collection facilities, cost-effective tools such as the digital carbon calculator, and external consultancy or training programmes to facilitate efficient CE adoption.
- Building a **skilled workforce** is essential and a key enabler. Training existing staff or hiring personnel with relevant expertise enhances a firm's capacity to implement CE practices effectively and sustain these practices over time. This also further embeds an ethos or theme of sustainability into the business.

7.4 Key Takeaways for Policymakers

The key takeaways for policymakers are as follows:

- Interventions to promote CE adoption should be holistic and multidimensional, combining financial support, tax incentives, technical training and access to affordable technology. Isolated

measures are unlikely to fully address the barriers SMEs face.

- Investment in local infrastructure such as recycling facilities, collection points and logistical support is crucial to facilitate the practical implementation of circular practices across SME sectors.
- Enhancing regulatory clarity and providing clear guidance on compliance requirements can reduce uncertainty and therefore encourage and enable more SMEs to adopt CE practices.
- Programmes that support recognition, branding and market access can motivate SMEs by demonstrating the reputational and commercial benefits of circular practices. Public acknowledgement, awards or certifications may act as effective enablers and incentives to accelerate adoption.
- Coordination across financial, technical and market-oriented enablers is likely to be the most effective strategy. Policies should not only provide resources but also create an ecosystem in which SMEs can access knowledge, technology, markets and recognition in tandem. This has the potential to enable SMEs to become the enablers of partner SMEs.

7.5 Future Research Directions

While this research provides valuable insights into the awareness, knowledge, barriers and enablers of CE adoption among Irish SMEs, it also highlights areas where further investigation is needed. Despite identifying key factors influencing engagement, the current research is cross-sectional and primarily descriptive, limiting our understanding of how CE adoption evolves over time and across different contexts. We touch on the concepts of micro-enablers or hidden enablers for SMEs around CE adoption, but more investigation is needed. Building on these findings, future research can explore sector-specific strategies, longitudinal adoption patterns and the effectiveness of policy and support mechanisms, thereby providing actionable guidance for both SMEs and policymakers seeking to accelerate the transition to a CE.

Future research could focus on developing and testing tailored CE interventions for specific sectors, particularly those with lower current engagement, such as service-oriented or specialised SMEs. By examining

sectoral differences in barriers, knowledge gaps and operational constraints, researchers could design context-specific strategies that address practical challenges and maximise adoption. Comparative studies across sectors could also identify best practices and transferable lessons for SMEs operating in different market contexts.

A longitudinal study could track SMEs over time to understand how awareness, knowledge and enablers translate into CE adoption. Such research would provide insights into the temporal dynamics of CE implementation, including the impact of capacity-building initiatives, policy interventions and market pressures. It would also help identify the factors that

sustain long-term CE practices and the pathways through which SMEs evolve from awareness to full integration.

Future work could also examine the effectiveness of specific policy instruments and financial incentives in facilitating CE adoption among SMEs. This could include evaluating grants, tax incentives, training programmes and technical support services to determine which mechanisms have the greatest impact on firm-level implementation. Such studies would provide evidence-based guidance for policymakers (e.g. the EPA) to design targeted support schemes that address SME-specific barriers while promoting broader CE objectives.

References

- Ahmadov, T. *et al.* (2025). SMEs on the way to a circular economy: Insights from a multi-perspective review. *Management Review Quarterly*, 75(1), pp. 289–322.
- Alcalde-Calonge, A., Ruiz-Palomino, P. and Sáez-Martínez, F.J. (2024). Fostering circular economy in small and medium-sized enterprises: The role of social capital, adaptive capacity, entrepreneurial orientation and a pro-sustainable environment. *Business Strategy and the Environment*, 33(8), pp. 8882–8899.
- Arranz, C.F.A., Arroyabe, M.F. and Fernandez de Arroyabe, J.C. (2024). Organisational transformation toward circular economy in SMEs. The effect of internal barriers. *Journal of Cleaner Production*, 456. <https://doi.org/10.1016/j.jclepro.2024.142307>.
- Bassi, F. and Dias, J.G. (2019). The use of circular economy practices in SMEs across the EU. *Resources, Conservation and Recycling*, 146, pp. 523–533.
- Bocken, N., Boons, F. and Baldassarre, B. (2019). Sustainable business model experimentation by understanding ecologies of business models. *Journal of Cleaner Production*, 208, pp. 1498–1512.
- Caldera, H.T.S., Desha, C. and Dawes, L. (2019). Evaluating the enablers and barriers for successful implementation of sustainable business practice in 'lean' SMEs. *Journal of Cleaner Production*, 218, pp. 575–590.
- Chaudhuri, A., Subramanian, N. and Dora, M. (2022). Circular economy and digital capabilities of SMEs for providing value to customers: Combined resource-based view and ambidexterity perspective. *Journal of Business Research*, 142, pp. 32–44.
- CSO (Central Statistics Office) (2022). Business in Ireland 2022 – Summary results. <https://www.cso.ie/en/releasesandpublications/ep/p-biisr/businessinireland2022summaryresults/mainresults/> (accessed 14 August 2026).
- CSO (Central Statistics Office) (2025). Ireland 2024: The year in numbers. <https://www.cso.ie/en/releasesandpublications/ep/p-yin/ireland2024theyearinnumbers/> (accessed 14 August 2026).
- Enterprise Ireland (2019). *Annual Report & Accounts 2019 – Build Scale, Expand Reach*. Enterprise Ireland, Dublin.
- EPA (Environmental Protection Agency) (2024a). *Construction and Demolition Research 2024*. EPA, Johnstown Castle, Ireland. [https://www.epa.ie/publications/circular-economy/resources/Construction-&Demolition-Report-\(2024\)_Final.pdf](https://www.epa.ie/publications/circular-economy/resources/Construction-&Demolition-Report-(2024)_Final.pdf) (accessed 14 August 2026).
- EPA (Environmental Protection Agency) (2024b). *A Critical Analysis of Ireland's Circular Material Use Rate (CAIR)*. EPA, Johnstown Castle, Ireland. <https://www.epa.ie/publications/research/reports/research-458-a-critical-analysis-of-irelands-circular-material-use-rate-cair.php> (accessed 14 August 2026).
- Findik, D., Tirgil, A. and Özbuğday, F.C. (2023). Industry 4.0 as an enabler of circular economy practices: Evidence from European SMEs. *Journal of Cleaner Production*, 410, 137281.
- García-Quevedo, J., Jové-Llopis, E. and Martínez-Ros, E. (2020). Barriers to the circular economy in European small and medium-sized firms. *Business Strategy and the Environment*, 29(6), pp. 2450–2464.
- Geissdoerfer, M. *et al.* (2017). The circular economy – A new sustainability paradigm? *Journal of Cleaner Production*, 143, pp. 757–768.
- Holzer, D. *et al.* (2021). Mind the gap: Towards a systematic circular economy encouragement of small and medium-sized companies. *Journal of Cleaner Production*, 298, p. 126696.
- Howard, M. *et al.* (2022). Going beyond waste reduction: Exploring tools and methods for circular economy adoption in small-medium enterprises. *Resources, Conservation and Recycling*, 182. <https://doi.org/10.1016/j.resconrec.2022.106345>.
- Kirchherr, J. *et al.* (2018). Barriers to the circular economy: Evidence from the European Union (EU). *Ecological Economics*, 150, pp. 264–272.
- Konietzko, J. *et al.* (2020). Circular business model experimentation: Demystifying assumptions. *Journal of Cleaner Production*, 277, p. 122596.
- Manninen, K. *et al.* (2018). Do circular economy business models capture intended environmental value propositions? *Journal of Cleaner Production*, 171, pp. 413–422.
- Matarazzo, M., Oduro, S. and Gennaro, A. (2024). Stakeholder engagement for sustainable value co-creation: Evidence from made in Italy SMEs. *Business Ethics, the Environment and Responsibility*, 34(2), pp. 347–361. <https://doi.org/10.1111/beer.12654>.

- OECD (Organisation for Economic Co-operation and Development) (2022). *The Circular Economy in Ireland*. OECD Urban Studies, OECD Publishing, Paris. <https://doi.org/10.1787/7d25e0bb-en>.
- Prieto-Sandoval, V. *et al.* (2018). Key elements in assessing circular economy implementation in small and medium-sized enterprises. *Business Strategy and the Environment*, 27(8), pp. 1525–1534.
- Rizos, V. *et al.* (2016). Implementation of circular economy business models by small and medium-sized enterprises (SMEs): Barriers and enablers. *Sustainability*, 8(11), p. 1212.
- Suchek, N., Ferreira, J.J. and Fernandes, P.O. (2022). A review of entrepreneurship and circular economy research: State of the art and future directions. *Business Strategy and the Environment*, 31(5), pp. 2256–2283.
- Tritto, N., Dias, J.G. and Bassi, F. (2024). SMEs circular economy practices in the European Union: Multilevel implications for sustainability. *Social Indicators Research*, 175(3), pp. 965–988.
- Troise, C. *et al.* (2023). Small and medium enterprises and sustainable business models: Exploring enabling factors for adoption. *Journal of Management and Organization* [Preprint]. <https://doi.org/10.1017/jmo.2023.45>.
- Tseng, M.L. *et al.* (2023). Causality of circular supply chain management in small and medium-sized enterprises using qualitative information: A waste management practices approach in Indonesia. *Annals of Operations Research* [Preprint]. <https://doi.org/10.1007/s10479-023-05392-5>.
- Ünal, E. *et al.* (2019). Value creation in circular business models: The case of a US small medium enterprise in the building sector. *Resources, Conservation and Recycling*, 146, pp. 291–307. <https://doi.org/10.1016/j.resconrec.2018.12.034>.
- Vermunt, D.A. *et al.* (2019). Exploring barriers to implementing different circular business models. *Journal of Cleaner Production*, 222, pp. 891–902.
- Voulgaridis, K., Angelopoulos, C.M. and Chatzimisios, P. (2020). Circularity principles in crowdsourced systems. *Proceedings of the 2020 Global Information Infrastructure and Networking Symposium (GIIS)*, pp. 1–5.
- Yaroson, E.V. *et al.* (2024). Unearthing the interplay between organisational resources, knowledge and industry 4.0 analytical decision support tools to achieve sustainability and supply chain wellbeing. *Annals of Operations Research* [Preprint]. <https://doi.org/10.1007/s10479-024-05845-5>.

Abbreviations

B2B	Business-to-business
B2C	Business-to-consumer
CE	Circular economy
SMEs	Small and medium-sized enterprises

An Ghníomhaireacht Um Chaomhnú Comhshaoil

Tá an GCC freagrach as an gcomhshaol a chosaint agus a fheabhsú, mar shócmhainn luachmhar do mhuintir na hÉireann. Táimid tiomanta do dhaoine agus don chomhshaol a chosaint ar thionchar díobhálach na radaíochta agus an truailithe.

Is féidir obair na Gníomhaireachta a roinnt ina trí phríomhréimse:

Rialáil: Rialáil agus córais chomhlíonta comhshaoil éifeachtacha a chur i bhfeidhm, chun dea-thorthaí comhshaoil a bhaint amach agus díriú orthu siúd nach mbíonn ag cloí leo.

Eolas: Sonraí, eolas agus measúnú ardchaighdeán, spriocdhírthe agus tráthúil a chur ar fáil i leith an chomhshaoil chun bonn eolais a chur faoin gcinnteoireacht.

Abhcóideacht: Ag obair le daoine eile ar son timpeallachta glaine, táirgiúla agus dea-chosanta agus ar son cleachtas inbhuanaithe i dtaobh an chomhshaoil.

I measc ár gcuid freagrachtaí tá:

Ceadúnú

- > Gníomhaíochtaí tionscail, dramhaíola agus stórála peitрил ar scála mór;
- > Sceitheadh fuíolluisce uirbigh;
- > Úsáid shrianta agus scaoileadh rialaithe Orgánach Géinmhodhnaithe;
- > Foinsí radaíochta ianúcháin;
- > Astaíochtaí gás ceaptha teasa ó thionscal agus ón eitlíocht trí Scéim an AE um Thrádáil Astaíochtaí.

Forfheidhmiú Náisiúnta i leith Cúrsaí Comhshaoil

- > Iniúchadh agus cigireacht ar shaoráidí a bhfuil ceadúnas acu ón GCC;
- > Cur i bhfeidhm an dea-chleachtais a stiúradh i ngníomhaíochtaí agus i saoráidí rialáilte;
- > Maoirseacht a dhéanamh ar fhreagrachtaí an údaráis áitiúil as cosaint an chomhshaoil;
- > Caighdeán an uisce óil phoiblí a rialáil agus údaruithe um sceitheadh fuíolluisce uirbigh a fhorfheidhmiú
- > Caighdeán an uisce óil phoiblí agus phríobháidigh a mheasúnú agus tuairisciú air;
- > Comhordú a dhéanamh ar líonra d'eagraíochtaí seirbhíse poiblí chun tacú le gníomhú i gcoinne coireachta comhshaoil;
- > An dlí a chur orthu siúd a bhriseann dlí an chomhshaoil agus a dhéanann dochar don chomhshaol.

Bainistíocht Dramhaíola agus Ceimiceáin sa Chomhshaol

- > Rialacháin dramhaíola a chur i bhfeidhm agus a fhorfheidhmiú lena n-áirítear saincheisteanna forfheidhmithe náisiúnta;
- > Staitisticí dramhaíola náisiúnta a ullmhú agus a fhoilsiú chomh maith leis an bPlean Náisiúnta um Bainistíocht Dramhaíola Guaisí;
- > An Clár Náisiúnta um Chosc Dramhaíola a fhorbairt agus a chur i bhfeidhm;
- > Reachtaíocht ar rialú ceimiceán sa timpeallacht a chur i bhfeidhm agus tuairisciú ar an reachtaíocht sin.

Bainistíocht Uisce

- > Plé le struchtúir náisiúnta agus réigiúnacha rialachais agus oibriúcháin chun an Chreat-treoir Uisce a chur i bhfeidhm;
- > Monatóireacht, measúnú agus tuairisciú a dhéanamh ar chaighdeán aibhneacha, lochanna, uiscí idirchreasa agus cósta, uiscí snámha agus screamhuisce chomh maith le tomhas ar leibhéil uisce agus sreabhadh abhann.

Eolaíocht Aeráide & Athrú Aeráide

- > Fardail agus réamh-mheastacháin a fhoilsiú um astaíochtaí gás ceaptha teasa na hÉireann;
- > Rúnaíocht a chur ar fáil don Chomhairle Chomhairleach ar Athrú Aeráide agus tacaíocht a thabhairt don Idirphlé Náisiúnta ar Gníomhú ar son na hAeráide;

- > Tacú le gníomhaíochtaí forbartha Náisiúnta, AE agus NA um Eolaíocht agus Beartas Aeráide.

Monatóireacht & Measúnú ar an gComhshaol

- > Córais náisiúnta um monatóireacht an chomhshaoil a cheapadh agus a chur i bhfeidhm: teicneolaíocht, bainistíocht sonraí, anailís agus réamhaisnéisiú;
- > Tuairiscí ar Staid Thimpeallacht na hÉireann agus ar Tháscairí a chur ar fáil;
- > Monatóireacht a dhéanamh ar chaighdeán an aeir agus Treoir an AE i leith Aeir Ghlain don Eoraip a chur i bhfeidhm chomh maith leis an gCoinbhinsiún ar Aerthruailliú Fadraoin Trasteorann, agus an Treoir i leith na Teorann Náisiúnta Astaíochtaí;
- > Maoirseacht a dhéanamh ar chur i bhfeidhm na Treorach i leith Torainn Timpeallachta;
- > Measúnú a dhéanamh ar thionchar pleananna agus clár beartaithe ar chomhshaol na hÉireann.

Taighde agus Forbairt Comhshaoil

- > Comhordú a dhéanamh ar ghníomhaíochtaí taighde comhshaoil agus iad a mhaoiniú chun brú a aithint, bonn eolais a chur faoin mbeartas agus réitigh a chur ar fáil;
- > Comhoibriú le gníomhaíocht náisiúnta agus AE um thaighde comhshaoil.

Cosaint Raideolaíoch

- > Monatóireacht a dhéanamh ar leibhéil radaíochta agus nochtadh an phobail do radaíocht ianúcháin agus do réimsí leictreamaighnéadacha a mheas;
- > Cabhrú le pleananna náisiúnta a fhorbairt le haghaidh éigeandálaí ag eascairt as tasmí núicléacha;
- > Monatóireacht a dhéanamh ar fhorbairtí thar lear a bhaineann le saoráidí núicléacha agus leis an tsábháilteacht raideolaíochta;
- > Sainseirbhísí um chosaint ar an radaíocht a sholáthar, nó maoirsiú a dhéanamh ar sholáthar na seirbhísí sin.

Treoir, Ardú Feasachta agus Faisnéis Inrochtana

- > Tuairisciú, comhairle agus treoir neamhspleách, fianaise-bhunaithe a chur ar fáil don Rialtas, don tionscal agus don phobal ar ábhair maidir le cosaint comhshaoil agus raideolaíoch;
- > An nasc idir sláinte agus folláine, an geilleagar agus timpeallacht ghlan a chur chun cinn;
- > Feasacht comhshaoil a chur chun cinn lena n-áirítear tacú le hiompraíocht um éifeachtúlacht acmhainní agus aistriú aeráide;
- > Tástáil radóin a chur chun cinn i dtithe agus in ionaid oibre agus feabhsúchán a mholadh áit is gá.

Comhpháirtíocht agus Líonrú

- > Oibriú le gníomhaireachtaí idirnáisiúnta agus náisiúnta, údaráis réigiúnacha agus áitiúla, eagraíochtaí neamhrialtais, comhlachtaí ionadaíocha agus ranna rialtais chun cosaint comhshaoil agus raideolaíoch a chur ar fáil, chomh maith le taighde, comhordú agus cinnteoireacht bunaithe ar an eolaíocht.

Bainistíocht agus struchtúr na Gníomhaireachta um Chaomhnú Comhshaoil

Tá an GCC á bainistiú ag Bord lánaimseartha, ar a bhfuil Ard-Stiúrthóir agus cúigear Stiúrthóir. Déantar an obair ar fud cúig cinn d'Oifigí:

1. An Oifig um Inbhuanaitheacht i leith Cúrsaí Comhshaoil
2. An Oifig Forfheidhmithe i leith Cúrsaí Comhshaoil
3. An Oifig um Fhianaise agus Measúnú
4. An Oifig um Chosaint ar Radaíocht agus Monatóireacht Comhshaoil
5. An Oifig Cumarsáide agus Seirbhísí Corparáideacha

Tugann coistí comhairleacha cabhair don Ghníomhaireacht agus tagann siad le chéile go rialta le plé a dhéanamh ar ábhair imní agus le comhairle a chur ar an mBord.

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