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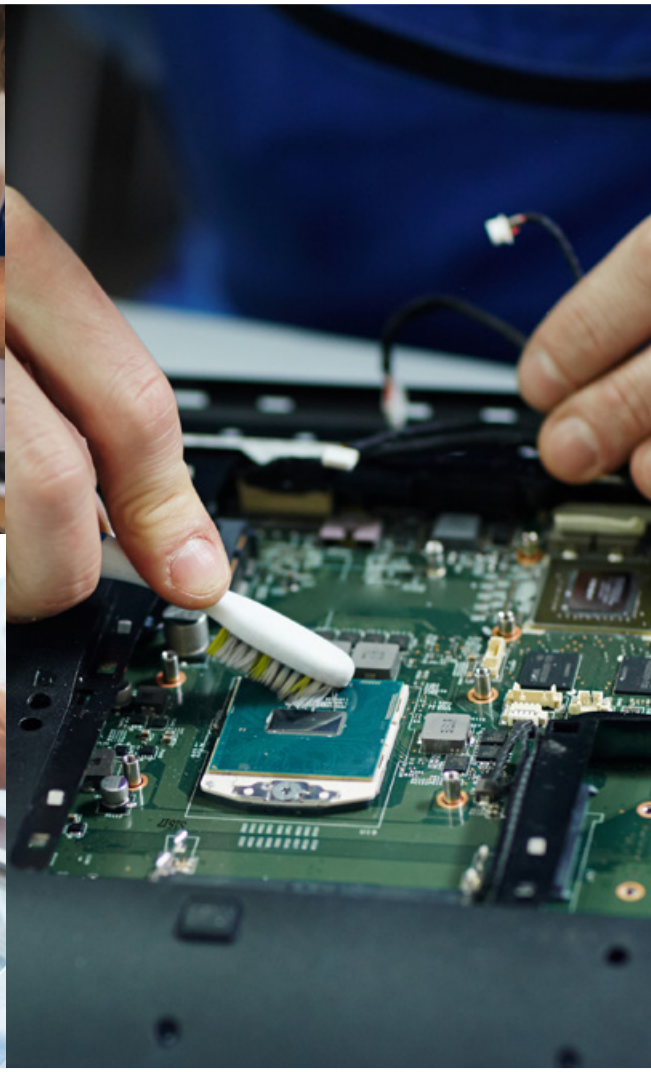
epa Research

The Role of Irish Small and Medium-sized Enterprises in the Transition to a More Circular Economy

Authors: Bernadette Power, Gordon Sirr, Geraldine Ryan and John Eakins

Lead organisation: University College Cork



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Rialtas na hÉireann
Government of Ireland

Environmental Protection Agency

The EPA is responsible for protecting and improving the environment as a valuable asset for the people of Ireland. We are committed to protecting people and the environment from the harmful effects of radiation and pollution.

The work of the EPA can be divided into three main areas:

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Knowledge: Providing high quality, targeted and timely environmental data, information and assessment to inform decision making.

Advocacy: Working with others to advocate for a clean, productive and well protected environment and for sustainable environmental practices.

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- Large-scale industrial, waste and petrol storage activities;
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- The contained use and controlled release of Genetically Modified Organisms;
- Sources of ionising radiation;
- Greenhouse gas emissions from industry and aviation through the EU Emissions Trading Scheme.

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- Promote environmental awareness including supporting behaviours for resource efficiency and climate transition;
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Partnership and Networking

- Work with international and national agencies, regional and local authorities, non-governmental organisations, representative bodies and government departments to deliver environmental and radiological protection, research coordination and science-based decision making.

Management and Structure of the EPA

The EPA is managed by a full time Board, consisting of a Director General and five Directors. The work is carried out across five Offices:

1. Office of Environmental Sustainability
2. Office of Environmental Enforcement
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 this research aim to address?

The research aimed to examine the role of Irish small and medium-sized enterprises (SMEs) in the transition to a more circular economy (CE) – a critical issue given Ireland's slow progress in this area and the central role of SMEs in the economy, accounting for over 99% of Irish businesses. As part of the project, a comprehensive survey of Irish SMEs was conducted to assess their engagement in the CE, with a particular focus on circular business models (CBMs). The survey also explored their motivations for CE engagement, the barriers they face and their views on supportive policies and interventions. In parallel, a survey of Irish consumers was carried out to assess their willingness to engage with various CBMs and the barriers limiting their participation. This project is innovative, as it is the first in Ireland to simultaneously examine the perspectives of both SMEs and consumers, providing an integrated evidence base to inform a more cohesive and effective policy framework for addressing the complex challenges of the CE transition.

What did this research find?

Irish SME and consumer engagement in the CE is low, with many barriers to engagement. However, there are encouraging signs, with many SMEs interested in adopting CBMs and evidence of untapped consumer demand for CE offerings. Sectoral differences also emerged in engagement with CBMs, with construction SMEs favouring product takeback schemes, manufacturing SMEs prioritising the use of secondary raw materials, and retail/wholesale SMEs focusing on selling second-hand and remanufactured/refurbished goods. Key CE barriers included market-, financial- and knowledge-related challenges, while cost savings and revenue generation were key motivations. However, these barriers and motivations varied across SME characteristics. Sector-specific barriers to adopting various CBMs were also identified, highlighting the breadth of obstacles that SMEs face. The consumer survey similarly revealed low engagement with CBMs but a high level of willingness to engage, particularly in product takeback schemes, followed by repair/maintenance services, buying remanufactured/refurbished goods, buying second-hand goods, and leasing/renting goods. Willingness to engage varied by product type and was higher among individuals of a low socioeconomic status. CBM-specific barriers were also identified, highlighting the need for targeted interventions.

How can the research findings be used?

The findings can inform policymaking aimed at advancing Ireland's CE transition, including the Whole of Government Circular Economy Strategy. The research highlights the need for a broad mix of policies and interventions to enable meaningful progress. Key recommendations prioritise addressing systemic barriers SMEs face, including market-, financial- and knowledge-related challenges. Fostering innovation in the economy and encouraging collaboration among SMEs are also emphasised. Targeted measures are also proposed to drive engagement with specific CBMs, offering practical solutions to overcome key barriers for both SMEs and consumers. Increasing consumer awareness and understanding of the CE is also recommended in order to broaden CE engagement and drive lasting behavioural change across society. Building on the project's findings, further research is needed to explore how best to support SMEs in scaling up CBMs and identify effective interventions for bridging the consumer intention–behaviour gap. Additional research is also recommended to determine how infrastructure investment should be prioritised to support CE implementation at scale and assess the most effective ways to scale social enterprises in support of the CE transition.

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The Role of Irish Small and Medium-sized Enterprises in the Transition to a More Circular Economy

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Prepared for the Environmental Protection Agency

by

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DISCLAIMER

This report is based on research carried out/data from March 2023 to March 2025. More recent data may have become available since the research was completed.

The EPA Research Programme addresses the need for research in Ireland to inform policymakers and other stakeholders on a range of questions in relation to environmental protection. These reports are intended as contributions to the necessary debate on the protection of the environment.

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Contents

List of Figures

List of Tables

Executive Summary

The circular economy (CE) offers a transformative approach to decouple resource use from environmental harm. Described as "an economy that is restorative and regenerative by design, aiming to keep products, components, and materials at their highest utility and value at all times",[1] the CE marks a shift from the traditional "take–make–waste" linear economy, which has driven a tripling of global resource consumption over the past 50 years, exacerbating climate change, pollution and biodiversity loss. Transitioning to the CE is now essential for addressing these environmental crises.

The CE has become central to EU policymaking, featuring prominently in the European Green Deal and the Paris Agreement. In Ireland, the government has also committed to the CE through policies like the Whole of Government Circular Economy Strategy 2022–2023 and the National Waste Management Plan for a Circular Economy 2024–2030. However, Ireland is lagging behind other nations in its CE transition, evident in its low circular material use rate of just 2.7%, far below the global average of 7.2%.[2] Our limited CE progress highlights the need for a more concerted and collective effort across society, with both businesses and consumers actively driving the transition.

Small and medium-sized enterprises (SMEs), which account for over 99% of Irish businesses,[3] are essential to Ireland's CE transition. However, little is known about their willingness to engage in the CE, their motivations and the barriers they face. International research shows that SMEs are often slow to engage in the CE, facing barriers such as limited information/knowledge, financial constraints/uncertainties, inadequate technology/equipment, limited access to circular materials, regulatory obstacles, product design issues and weak consumer/supplier participation. Nevertheless, some SMEs are embracing the CE, spurred by factors like cost savings, revenue generation, supplier engagement, technological advancements and regulatory pressures. For Irish CE policymakers, understanding the barriers and motivations of Irish SMEs is critical for supporting the CE transition.

Consumers can shape the CE transition by how they use, reuse and dispose of products. By embracing CE products and services, they can help close the loop and support circular business models (CBMs). In Ireland, however, there is limited understanding of consumer willingness to engage in the CE and the barriers hindering their participation. International research shows that, while consumers tend to prefer new products, their CE engagement often depends on the specific product/service, as well as factors like cost, convenience, quality and availability. For Irish policymakers, understanding consumer engagement and barriers can help inform more effective CE policies.

Against this background, this project conducted an in-depth analysis of Irish SME and consumer engagement in the CE. A survey of SMEs revealed low levels of CE engagement, especially in CBMs. Sectoral differences also emerged, with construction SMEs favouring CBMs involving product takeback schemes, manufacturing SMEs prioritising the use of secondary raw materials, and retail/wholesale SMEs focusing on selling second-hand and remanufactured/refurbished goods. Key CE barriers included market-, financial- and knowledge-related challenges, while cost savings and revenue generation were key motivations. However, these barriers and motivations varied across SME characteristics. Sector-specific barriers to adopting various CBMs were also identified, highlighting the breadth of obstacles facing SMEs.

1 *Towards a Circular Economy: Business Rationale for an Accelerated Transition*, Ellen MacArthur Foundation, 2015, p. 19; https://www.ellenmacarthurfoundation.org/towards-a-circular-economy-business-rationale-for-an-accelerated-transition (accessed 2 January 2025).

2 *Circularity Gap Report – Ireland*, Circle Economy, 2024; https://www.circularity-gap.world/ireland (accessed 2 January 2025).

3 Business in Ireland 2021 – detailed results, Central Statistics Office, 2024; https://www.cso.ie/en/releasesandpublications/ep/p-biidr/businessinireland2021detailedresults/smallandmediumenterprises/ (accessed 3 January 2025).

A survey of Irish consumers also revealed low engagement with CBMs but a high level of willingness to engage, indicating a latent underlying demand for CE products and services. Preferences for CBM engagement were also hierarchical: product takeback schemes were the most favoured, followed by repair/maintenance services, purchasing remanufactured/refurbished goods, second-hand goods and leasing/renting goods. However, willingness to engage with these CBMs also varied by product type and was higher among individuals of a low socioeconomic status. CBM-specific barriers were also identified, highlighting the need for tailored interventions to boost consumer participation.

Given the complexity of the CE transition and our current low engagement with it, a broad range of policies and interventions are necessary to drive meaningful progress. This project's findings lay a foundation for shaping these strategies. General policy recommendations are proposed, prioritising addressing systemic barriers to SMEs, including market-, financial- and knowledge-related challenges. Measures aimed at fostering innovation in the economy and collaboration among businesses are also recommended. Targeted interventions are also proposed to drive engagement with specific CBMs, with innovative solutions aimed at overcoming the key barriers to both SMEs and consumers.

1 Introduction

1.1 Research Background and Relevant Literature

The circular economy (CE) concept is gaining momentum as a way to decouple resource use from environmental harm. Although still an evolving concept, it is broadly described as “an economy that is restorative and regenerative by design, aiming to keep products, components, and materials at their highest utility and value at all times” (EMF, 2015; p. 19). In contrast to the linear economy (LE) model of production and consumption, the CE seeks to establish a closed-loop system that optimises resource use and minimises waste. Key to this are circular business models (CBMs) in which “value creation is based on utilising economic value retained in products after use” and which extend product life cycles through activities such as product takeback, reuse, recycling, repair, refurbishment, remanufacturing and leasing (Linder and Williander, 2017; p. 183). These business models not only reduce waste but also encourage businesses to rethink product design and material sourcing. In addition to CBMs, the CE also aims to reduce environmental harm more broadly, by optimising material, energy and water use, while also prioritising renewable energy sources.

While the CE holds transformative potential, the Irish economy, like many others worldwide, remains deeply entrenched in the LE. This is emphasised in Ireland’s 2024 Circularity Gap Report, commissioned by the then Department of the Environment, Climate and Communications, and published by Circle Economy, which presents stark statistics on our progress towards a CE (Circle Economy, 2024). Currently, Irish residents are consuming 22 tonnes of raw materials per person annually, exceeding the European average of 17 tonnes per capita, and well above the global average of 12 tonnes per capita. Even more alarmingly, our material consumption rate is almost three times higher than the estimated sustainable level of 8 tonnes per capita. Adding to the concern, our circular material use rate (CMUR) – a key CE metric that measures the share of materials reused within the economy – stands at just 2.7%. This means that over 97% of the materials circulating in the economy come from virgin sources. By contrast, the global CMUR was 7.2% in 2023, underscoring Ireland’s laggardness in adopting circular materials (Circle Economy, 2024).

Our limited CE progress highlights the complexity of the transition and the need for a stronger, more collective effort across society. In particular, businesses and consumers have critical roles to play, being at the heart of production and consumption systems. Businesses shape the design, production and life cycle of products, making decisions on materials, durability and recyclability, directly influencing resource efficiency and waste reduction. Their adoption of CBMs is also critical for market supply of CE products and services. Consumers, however, drive demand for products and determine how they are used, reused and disposed of. Embracing sustainable consumption habits, such as opting for durable and repairable products, as well as remanufactured, refurbished, second-hand and leased items, can help to close the loop and build a business case for CBMs. Only through the combined and active efforts of both groups can we achieve meaningful progress.

Despite the dominance of the LE, there are many motivations for businesses to engage in the CE. Cost savings are a key motivator, with reduced material consumption and improved resource efficiency lowering operational costs (Prieto-Sandoval *et al*., 2018). Revenue generation is also a key driver, with CBMs offering businesses opportunities to access new markets (Rizos *et al*., 2016) and diversify their revenue streams (Salvador *et al*., 2020). Similarly, consumer preferences may spur engagement, as businesses can attract environmentally conscious consumers (Rizos *et al*., 2016) and enhance their brand image (Ormazabal *et al*., 2018). Shifting from global to local circular supply chains can also alleviate supply chain risks, such as material shortages and price volatility (OECD, 2019). The willingness of suppliers and business partners to engage in the CE can also be a motivator, increasing resource availability and business opportunities (Hina *et al*., 2022). Increased innovation in the economy, such as the use of digital technologies, can also catalyse engagement,

helping businesses optimise resource use, enhance material flow and access customers (Ranta *et al*., 2021). Additionally, regulatory pressures may spur engagement by pushing businesses to transform their operations to meet sustainability targets or avoid penalties (Arranz *et al*., 2022).

Despite these motivations, many businesses, and particularly small and medium-sized enterprises (SMEs), remain hesitant to engage in the CE (OECD, 2022). As the backbone of the Irish economy, SMEs account for over 99% of Irish businesses (CSO, 2024) and hence have a critical role to play in the transition. However, they also face greater challenges than larger firms. In the academic literature, it is highlighted that SMEs are often constrained by a lack of financial resources, which limits their capacity to invest in CE initiatives (Ghisetti and Montresor, 2020). They also generally employ fewer highly skilled employees than larger firms, resulting in less expertise to adopt more complex CBMs (Zhu *et al*., 2022). Furthermore, unlike multinational enterprises, which are often market leaders capable of influencing CE development, SMEs tend to be smaller market players, often limited to following trends rather than driving change (Rizos *et al*., 2016). Because of these challenges, SMEs are typically slower to engage in the CE than larger firms (Majumdar and Sinha, 2018; Zhu *et al*., 2022).

Beyond these unique obstacles, SMEs also face a broader range of CE barriers common to all firms. A growing body of literature has examined these barriers, highlighting not only financial (Garrido-Prada *et al*., 2021) and employee (Mura *et al*., 2020) constraints, but also issues such as a lack of management commitment towards sustainability (Mura *et al*., 2020), a lack of CE information (Garrido-Prada *et al*., 2021) and knowledge (Salvioni *et al*., 2022), uncertainty about the financial benefits of CE initiatives (Ormazabal *et al*., 2018), potential adverse impacts on sales of existing products (Boyer *et al*., 2021), a lack of appropriate technology and equipment (Sharma *et al*., 2021), regulatory obstacles (Kirchherr *et al*., 2018), product design challenges (Bocken *et al*., 2016), limited consumer interest in the CE (Kirchherr *et al*., 2018) and weak supplier support (Rizos *et al*., 2016). Emerging research on the barriers inhibiting engagement in particular types of CBMs, while still nascent, raises further issues, such as limited access to secondary raw materials (Vermunt *et al*., 2019), logistical challenges and collaboration requirements for takeback schemes (Försterling *et al*., 2023), a lack of access to parts for repairing and remanufacturing products (Försterling *et al*., 2023), and high capital requirements for engaging in leasing (Vermunt *et al*., 2019).

The influence of SME characteristics in driving CE engagement is highlighted in some studies. For instance, larger-sized enterprises with greater capabilities are more likely to engage in CE activities (Garrido-Prada *et al*., 2021) and view them as strategically important for their enterprise (Salvioni *et al*., 2022). However, circular start-ups are noted as facing fewer challenges related to employee knowledge and reluctance to engage, making it easier for them to implement CE activities than established firms (Guldmann and Huulgaard, 2020). The sectors in which SMEs operate also affect CE engagement, with resource- and materials-intensive sectors, including utilities, manufacturing and construction, exhibiting greater engagement than the services sector (Katz-Gerro and López Sintas, 2019). SMEs involved in research and development (R&D) also typically engage more in CE activities, indicating that engagement is not just about adopting ready-made technologies and solutions but also requires innovative efforts (Garrido-Prada *et al*., 2021). Additionally, SMEs that sell directly to consumers have been observed to exhibit higher CE engagement than those selling to businesses, underscoring the importance of consumers in driving the CE transition (Garrido-Prada *et al*., 2021).

Beyond the SME literature, other smaller strands of research have explored consumer engagement with various CBMs, highlighting varying levels of engagement across product types. Consumers tend to be highly willing to engage with takeback schemes for easy-to-return items like reusable packaging (Bocken *et al*., 2022) and for home collection of bulky items like washing machines (Mansuy *et al*., 2020). However, they are often reluctant to return items to unstaffed drop-off points (Mansuy *et al*., 2020) and are inclined to stockpile electronic waste, like mobile phones and laptops (Ramzan *et al*., 2019). Consumers also tend to be willing to use repair services for high-value products like cars, expensive tools and large household appliances but are hesitant to use these services for lower-cost items like clothing, furniture and small household appliances (Rogers *et al*., 2021). In general,

consumers are also reluctant to buy second-hand (Bovea *et al*., 2017), remanufactured (Michaud and Llerena, 2010) and refurbished (van Weelden *et al*., 2016) products, instead preferring brand-new products. However, this preference is less evident for certain products, such as premium remanufactured products that look and function like new (Hunka *et al*., 2020) and refurbished products with ageless designs (Wallner *et al*., 2020). Additionally, consumers tend to have a strong preference for owning products, which deters them from leasing or renting (Guillen-Royo, 2023), particularly low-cost items (Kuah and Wang, 2020).

Studies examining barriers to consumer engagement in the CE often identify quality, price and convenience among the key obstacles. Quality concerns are cited as the main barrier to purchasing various types of second-hand products, including textiles, electronic equipment and appliances, furniture, books and video games (EC, 2014), while hygiene concerns specifically are reported as the main reason for rejecting second-hand clothing (Colasante and D'Adamo, 2021) and food equipment (Bovea *et al*., 2017). Quality issues also affect engagement with refurbished products, with inferior functionality and lifespan cited as the main reasons for avoiding refurbished mobile phones (van Weelden *et al*., 2016). Perceived quality of repairs (Chang *et al*., 2013) and trust in repair providers (McCollough and Qiu, 2021) also affect engagement with repair services, while concerns about product damage deter consumers from leasing or renting products, such as electronic devices (Kuah and Wang, 2020). In addition to quality, the price of CE products and services is another key barrier, with low price differentials relative to LE offerings deterring engagement with repair services (Rogers *et al*., 2021), as well as second-hand (Bovea *et al*., 2017), remanufactured, refurbished (Boyer *et al*., 2021) and leased (Mashhadi *et al*., 2019) products. Convenience also plays a significant role, with long travel distances and limited access to drop-off points affecting engagement in takeback schemes (Bocken *et al*., 2022), inconvenient opening hours and lengthy wait times reducing satisfaction with repair services (Güsser-Fachbach *et al*., 2023), and a lack of familiarity with online platforms limiting the use of leasing platforms (Kuah and Wang, 2020).

Engagement with CBMs is also influenced by consumer characteristics, with income, age, gender and knowledge about CBMs often identified as key factors. For cost reasons, lower-income consumers are typically more willing to repair products, such as washing machines and refrigerators (McCollough, 2020), lease or rent products, like cars and houses (Mykkänen and Repo, 2021), and buy second-hand products, including televisions and mobile phones (EC, 2018). They are also more likely to participate in incentivised takeback schemes for waste electrical and electronic equipment (WEEE) (Botelho *et al*., 2016). Younger consumers tend to be more willing to buy second-hand products, such as household appliances (EC, 2018), remanufactured products, such as laptops (Hazen *et al*., 2016), and lease or rent products, like electronic devices (Kuah and Wang, 2020). By contrast, older consumers are typically more inclined to repair products, such as small household appliances (Pérez-Belis *et al*., 2017). Females are more likely to seek a professional repairer to fix expensive tools and bikes (Rogers *et al*., 2021) and return WEEE via home collection. In contrast, males are typically more willing to perform repairs themselves (Rogers *et al*., 2021), return WEEE in exchange for money and purchase remanufactured products like laptops (Hazen *et al*., 2016). A lack of awareness of repair services also hinders engagement in repairs, especially among females (Rogers *et al*., 2021), while limited knowledge of takeback schemes inhibits returns of products like electronic waste (Islam *et al*., 2021). A lack of knowledge about refurbished (van Weelden *et al*., 2016) and remanufactured (De Silva *et al*., 2021) products also deters engagement with these products, contributing to perceptions of inferior quality.

1.2 Policy Context

In Ireland, the government has taken significant steps to advance the CE transition, with the Whole of Government Circular Economy Strategy 2022–2023 serving as the first dedicated policy framework, aimed at enhancing public sector leadership, narrowing Ireland's circularity gap, raising public awareness, supporting investment for sustainable and regionally balanced growth, and addressing key economic, regulatory and social barriers. It also set the agenda for future policy, emphasising sectoral roadmaps and CBMs involving secondary raw materials, product takeback, reuse, repair, refurbishment, remanufacture and leasing (DECC, 2021). Complementing this, the Waste Action Plan

for a Circular Economy 2020–2025 shifted the focus from waste disposal to resource preservation, with over 200 measures targeting areas such as municipal, food, textiles, plastic and packaging waste, single-use plastics, waste management infrastructure, end-of-waste criteria, waste enforcement, extended producer responsibility, green public procurement, awareness and education, and research and innovation. The National Waste Management Plan for a Circular Economy 2024–2030 also introduced a more unified approach to waste management by consolidating regional plans into a national framework, with the goal of achieving 0% total waste growth per person by 2030. Underpinning this plan are targets and actions aimed at enhancing waste management collection and compliance, reducing waste in areas such as food, packaging, textiles and construction, and supporting reuse, repair and recycling systems (RWMPO, 2024). The Circular Economy and Miscellaneous Provisions Act 2022 has also enshrined the CE in Irish law, mandating updates of national strategy, establishing the Circular Economy Programme within the Environmental Protection Agency (EPA), and setting the legal basis for actions and targets that support the CE transition (Government of Ireland, 2022). It has also established the Circular Economy Fund to provide ongoing, ring-fenced financial support for CE initiatives (DECC, 2021; Government of Ireland, 2022).

Currently, the Irish Government is developing the second iteration of the Whole of Government Circular Economy Strategy, which is set to introduce more detailed actions and sector-specific targets. Key objectives will include advancing the development of CBMs and accelerating the CE transition in resource-intensive industries, such as construction, retail, textiles and electronic equipment (Circle Economy, 2024; DECC, 2022). Alongside economy-wide CE policy, the government is also preparing activity-specific policies, such as the Policy Statement on Geothermal Energy for a Circular Economy (DECC, 2023) and the Policy Statement on Mineral Exploration and Mining – Critical Raw Materials for the Circular Economy Transition (DECC, 2022). Sectoral policies have also been developed with the CE in mind. For example, *Housing for All: A New Housing Plan for Ireland* (DHLGH, 2021) emphasises the need to reduce construction and demolition waste in accordance with CE principles, while Food Vision 2030 aims to embed the agri-food sector in the circular bioeconomy (DAFM, 2022).

At the EU level, the CE has become a central pillar of environmental policy. The European Commission's first Circular Economy Action Plan, adopted in 2015, laid the groundwork for Europe's transition towards a CE, emphasising competitiveness, sustainable growth and job creation. In 2020, a new Circular Economy Action Plan was introduced as part of the European Green Deal, with more ambitious goals to reduce waste, develop markets for secondary raw materials, transform product design, make sustainable products and business models the norm, and empower consumers and public buyers, while also targeting resource-intensive sectors, including electronics, batteries, vehicles, packaging, plastics, textiles, construction and food. To support the transition, several legislative measures have been developed, such as the Batteries Directive, Corporate Sustainability Reporting Directive, Ecodesign Directive, End-of-Life Vehicles Directive, Industrial Emissions Directive, Packaging and Packaging Waste Directive, Right to Repair Directive, Single-Use Plastics Directive, Waste Electrical and Electronic Equipment Directive and Waste Framework Directive. Some of these measures have also been converted into binding regulations applicable across all EU Member States, such as the Battery Regulation ((EU) 2023/1542) (EU, 2023), the Ecodesign for Sustainable Products Regulation ((EU) 2024/1781) (EU, 2024) and the Packaging and Packaging Waste Regulation ((EU) 2025/40) (EU, 2025). Beyond the EU, the United Nations is also a strong advocate for the CE, with the United Nations Environment Programme recognising its role in achieving the Sustainable Development Goals, particularly Goal 12, which focuses on sustainable consumption and production (UNEP, 2025). Discussions on the CE have also gained momentum at the United Nations Conference of the Parties. At COP29 (the 29th Conference of the Parties), a ministerial meeting titled "Empowering Interregional Partnerships for Circular Economy Transition" focused on how materials efficiency and CE approaches can address greenhouse gas emissions (UNEP, 2024). Additionally, a joint report by the multilateral development banks titled *The Circular Economy in Motion* showcased 20 global projects across sectors like plastics, textiles and electronic waste, emphasising

the social, economic and environmental benefits of CE investments (EIB, 2024).

1.3 Objectives, Structure and Contributions

In the light of the research background and policy context, this project sought to examine the role of Irish SMEs in advancing towards a CE, with the primary goal of supporting their transition efforts. To achieve this, the project's broad objectives were as follows: (1) assess current levels of SME engagement in the CE, including engagement in CBMs and other CE activities; (2) identify trends in SME engagement in the CE over time; (3) determine the motivations for SME engagement in the CE; (4) identify the barriers to SME engagement in the CE; (5) identify the barriers to SME engagement in various CBMs; (6) assess consumer awareness and knowledge of the CE; (7) evaluate consumer willingness to engage with various CBMs; (8) identify the barriers to consumer engagement with various CBMs; and (9) recommend policies and interventions to enhance SME engagement in the CE, considering both SME and consumer perspectives.

The report is structured as follows. Chapter 2 outlines findings from a survey of Irish SMEs, conducted as part of this project. The survey, administered to SME owners and managers in the construction, manufacturing and retail/wholesale sectors, examined engagement in various CBMs as well as other CE activities. It also explored the motivations for and barriers to engagement, as well as policies and interventions that could support increased engagement. Chapter 2 also features a trend analysis of Irish SME engagement in CE activities over the period 2016–2024, comparing data from our survey of Irish SMEs, conducted in 2024, with data from the European Commission's 2016 Flash Eurobarometer 441 survey (EC, 2016), which also examined Irish SME participation in CE activities. Chapter 3 presents insights from a survey of Irish consumers, also carried out as part of the project. This survey, administered to Irish residents, investigated their purchasing behaviours, awareness and knowledge of the CE and their willingness to engage with various CBMs by product type. Chapter 4 provides recommendations on policies and interventions that could support SME engagement in the CE, including targeted measures to enhance participation in various CBMs, synthesising the findings from Chapters 2 and 3. Lastly, Chapter 5 concludes the report by summarising the project's key takeaways and proposing directions for future research.

The project makes a substantial contribution to existing knowledge on Irish SME engagement in the CE, providing the most comprehensive research to date on the barriers to and motivations and supportive policies and interventions for CE engagement. Until now, understanding of Irish SME participation in the CE has been limited mainly to two surveys: (1) a 2018 survey carried out jointly by the Irish Business and Employers Confederation and the EPA; and (2) the European Commission's 2016 Flash Eurobarometer 441 survey. While providing valuable insights, both surveys were narrower in scope than this project. Key features of this project include its examination of Irish SME engagement in CBMs, which were not considered in the previous surveys and are critical for the shift to a CE, as well as its deeper analysis of the barriers to and motivations and supportive measures for CE engagement. Additionally, the project contributes significantly to international knowledge on SME engagement in the CE. Despite a growing body of literature on the barriers to SME engagement in the CE, most of it is theoretical, conceptual or case based, with limited studies examining SME engagement across different types of CBMs (Försterling *et al*., 2023; Vermunt *et al*., 2017) and their views on CE policies (Milios, 2021), with several authors calling for more empirical analyses (Garcés-Ayerbe *et al*., 2019; García-Quevedo *et al*., 2020; Govindan and Hasanagic, 2018; Jabbour *et al*., 2020; Mura *et al*., 2020). This project directly fills these gaps in the literature by surveying Irish SMEs.

The project also advances understanding of Irish consumer engagement in the CE, offering the most complete research to date on their willingness to engage with various CBMs and the barriers hindering consumer engagement. While previous Irish research, including surveys by the EPA and the Central Statistics Office (CSO), has provided valuable insights into consumer engagement with takeback schemes (Coughlan and Fitzpatrick, 2020; EPA, 2024), repair services (EPA, 2023), leasing and renting (CSO, 2021a; EPA, 2024) and second-hand goods

(CSO, 2021b; EPA, 2024), this project provides a more detailed analysis by examining consumer engagement and its barriers across various CBMs and by product type. In doing so, it adds to the scarce international research on consumer CE engagement, responding to calls for further research in this area (Georgantzis Garcia *et al*., 2021; Kirchherr *et al*., 2017; Schulz *et al*., 2019; Vidal-Ayuso *et al*., 2023). Furthermore, and perhaps most importantly, the project is the first of its kind in Ireland to simultaneously examine the perspectives of both SMEs and consumers, integrating their views to inform a more cohesive policy framework for addressing the complex challenges of transitioning to a CE.

2 SME Engagement in the Circular Economy

SME engagement in the CE was examined through a survey of 452 Irish SMEs, conducted over May–July 2024. The survey was administered online by a market research company (Qualtrics). All respondents were owners/managers of SMEs involved in the construction, manufacturing and retail/wholesale sectors. The survey began with a definition of the CE, followed by sections eliciting information on (1) SME engagement in various CBMs and other CE activities; (2) motivating factors for SME engagement in the CE; (3) perceived barriers to SME engagement in the CE; (4) perceived barriers to SME engagement in various CBMs; (5) potential policies/interventions to support SME engagement in the CE; and (6) SME and respondent characteristics.

Summary statistics for the sample are presented in two forms in Table A1.1 in Appendix 1: unweighted percentages, reflecting the actual composition of the SMEs and respondents surveyed (i.e. unweighted sample) and weighted percentages, showing the composition of the sample after weighting it to align it with the actual distribution of Irish SMEs (construction, manufacturing and retail/wholesale SMEs) by sector, size and region (i.e. weighted sample). Looking at the unweighted sample, the distribution across SME sectors and sizes is relatively balanced. Just over one-third (35.4%) of SMEs are located in Dublin, while just over a half (51.8%) were established in the last 10 years (since 2014). The majority (92.0%) generate revenue through both business-to-consumer (B2C) and business-to-business (B2B) sales, while just over a half (51.7%) have export sales. Regarding the respondents, most are either SME owners, part-owners or hold senior managerial roles (85.8%), a large share are aged 35–54 years (62.8%) and the majority are male (81.0%). In this section, the results are all based on the weighted sample. This is to ensure that the results accurately represent the broader population of SMEs across the three sectors.

2.1 SME Engagement in Circular Business Models and Other Circular Economy Activities

In the survey, the respondents were presented with six types of CBMs and for each one were asked to indicate if their company was engaging in the CBM, considering engaging, or neither engaging nor considering engaging. Those neither engaging nor considering engaging in a CBM were also asked if they were aware of any opportunities to engage. Figure 2.1 presents the results. Of the CBMs examined, the use of secondary raw materials has the highest engagement (32.6%), followed by selling second-hand goods (30.5%), taking back old/used goods (30.2%), providing repair/maintenance services (27.6%) and selling remanufactured/refurbished goods (27.1%). Leasing/renting goods (instead of selling goods) shows the lowest engagement, with just 18.2% of SMEs engaged in this model.[4] Notably, large shares of SMEs are not engaging in the various CBMs, with almost all non-engagers unaware of opportunities. However, considerable shares are considering engaging, ranging from 20.6% in the case of selling second-hand goods to 30.0% in the case of providing repair/maintenance services, indicating potential for increased engagement.

Figure 2.2 presents a sectoral breakdown of the results, showing the percentages of SMEs in various sectors currently engaging in each CBM. Sectoral differences are evident. Most notably, construction SMEs exhibit higher levels of engagement across all CBMs than manufacturing and retail/wholesale SMEs. Sectoral preferences for specific CBMs are also evident. In the construction sector, the most common CBM is taking back old/used goods from customers (42.2%). By contrast, using secondary raw materials is the most common one in the manufacturing sector (36.5%). In the retail/wholesale sector, selling second-hand (30.0%) and remanufactured/refurbished goods (28.5%) are the most prevalent CBMs.

4 For clarity, leasing/renting goods (instead of selling them) refers to the provision of these services by SMEs, rather than their usage.

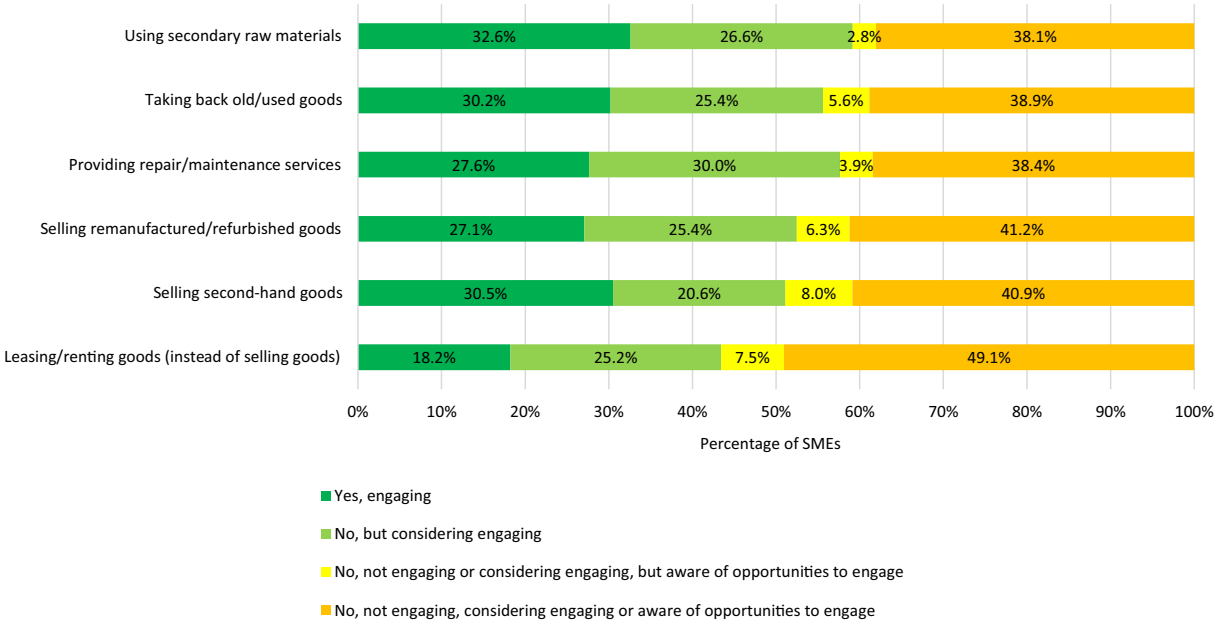

Figure 2.1. SME engagement in various CBMs.

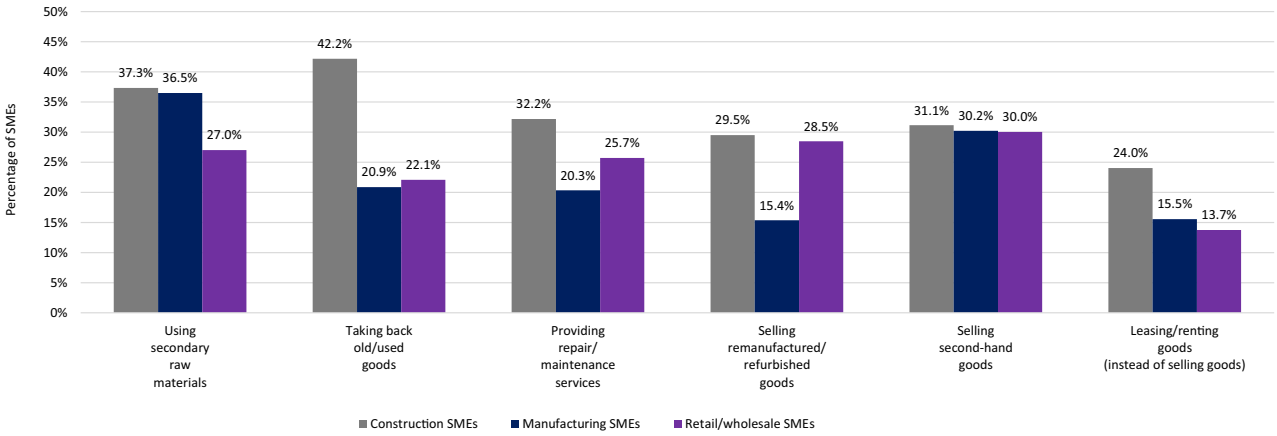

Figure 2.2. SME engagement in various CBMs, by sector.

The survey also asked respondents about five other types of CE activities, specifically whether these activities had been implemented in their company in the last 3 years or were currently under way. For those whose company had neither implemented nor started an activity, respondents were also asked if they planned to do so. Figure 2.3 presents the results, showing that just under one-third of SMEs have implemented each activity in the last 3 years. These include minimising waste by recycling or reusing waste or selling it to another company (30.7%), re-planning of the way water is used to minimise usage and maximise re-usage (30.1%), re-planning energy usage to minimise consumption (30.0%), re-designing products and services to minimise the use of materials or use recycled materials (29.5%) and using renewable energy (28.8%).[5] Although many SMEs have not implemented the activities, many

5 In relation to minimising waste by recycling or reusing waste or selling it to another company, it is important to note the fundamental differences between these activities: recycling transforms materials into new products, reusing extends an item's lifespan without alteration, and selling transfers waste for repurposing by another company. In the survey, 45.0% of SMEs reported either recycling waste in the last 3 years or having this activity under way, 41.2% had either reused waste or were in the process of doing so, and 31.6% had either sold waste or were actively implementing this practice.

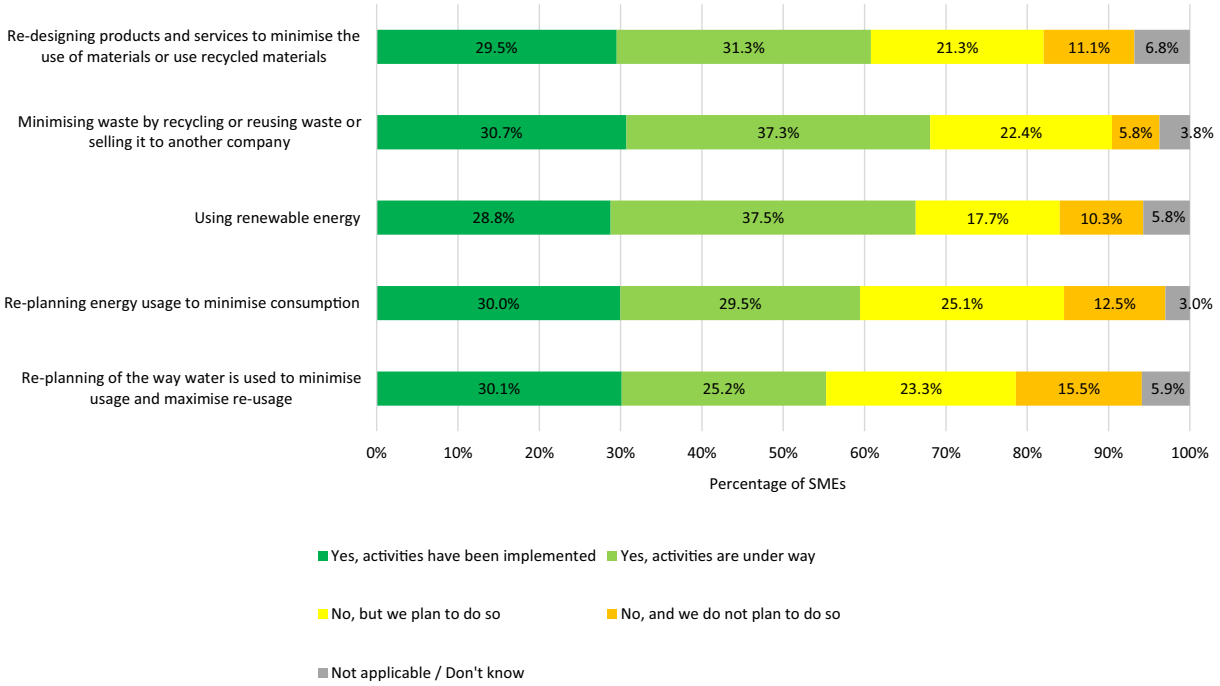

Figure 2.3. SME engagement in various CE activities.

are in the process of doing so, ranging from 25.2% currently re-planning the way water is used to 37.5% currently undertaking activities related to renewable energy. However, there are also some SMEs that have not implemented or started the activities and do not plan to implement them. Most notably, 15.5% of SMEs have not re-planned their water usage and do not plan to do so.

While Figures 2.1 and 2.3 depict generally positive levels of CE engagement, a different picture emerges on examining the number of CBMs that SMEs are engaging in. Figure 2.4 shows that the majority of SMEs are engaging in either none (28.5%) or only one (30.1%) of the CBMs, indicating limited adoption of multiple models. In contrast, Figure 2.4 shows greater SME involvement in multiple types of other CE activities, with considerable shares engaged in three (17.3%), four (24.5%) or even all five (24.7%) of the activities. This suggests that SMEs find it easier to engage in CE activities, such as waste reduction or energy optimisation, than to adopt CBMs, which typically involve more complex changes to business operations and value generation.

To provide additional insights into CE engagement, Table A1.2 in Appendix 1 displays a matrix with the number of CBMs that SMEs are currently engaged in and the number of CBMs they are considering engaging in. A clear pattern is evident, whereby SMEs engaging in fewer CBMs are considering fewer additional ones. For example, of the 28.5% of SMEs that are not currently engaged in any CBM, the majority (20.1%) are not considering any. In contrast,

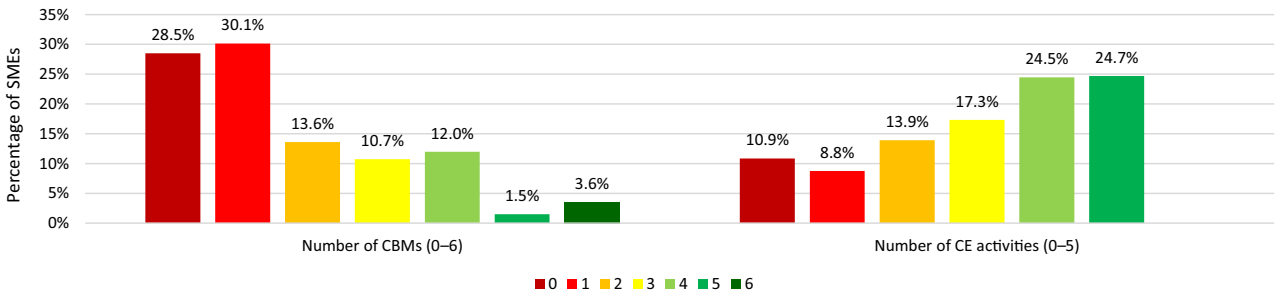

Figure 2.4. Number of CBMs and other CE activities in which SMEs are engaged.

of the 24.2% of SMEs currently engaged in three, four or five CBMs, most (18.5%) are considering all of the remaining ones, whether it be one, two or three additional models. In Table A1.3 in Appendix 1, a similar pattern can be observed with respect to CE activities, with SMEs with fewer activities implemented or under way also planning to implement fewer additional ones. For example, of the 10.9% of SMEs not engaged in any CE activity, almost half (4.2%) are not planning any. In contrast, of the 41.9% of SMEs with three or four activities implemented or under way, most (37.1%) are planning to implement all of the remaining ones, whether that is one or two additional activities.

To shed light on the types of SMEs that are more actively engaging in the CE, Table 2.1 reports the percentages of SMEs with higher versus lower engagement in both the CBMs and the other CE activities, broken down by SME characteristic.

Similar patterns emerge across both the CBMs and other CE activities. Construction SMEs show higher engagement than manufacturing and retail/wholesale SMEs, possibly due to the nature of the construction sector and its high material usage and waste generation. Medium-sized enterprises also engage more than micro- and small-sized enterprises, probably due to their greater resources for investing in sustainability initiatives, along with external pressures to adopt sustainable practices. SMEs located outside Dublin also show higher engagement than those in Dublin, possibly reflecting lower affluence outside the capital, where demand for CE products/services may be greater. Older SMEs also show higher engagement than newer SMEs, probably due to their more established operations and greater experience with sustainability initiatives. Additionally, SMEs focused on B2B sales or engaged in exports also have higher engagement than those selling mainly to consumers or the domestic market only, suggesting a stronger

Table 2.1. Percentage of SMEs with high versus low engagement in various CBMs and other CE activities, by SME characteristic

	CBMs		CE activities	
SME characteristic	High engagement (2–6 CBMs) (%)	Low engagement (0 or 1 CBM) (%)	High engagement (3–5 CE activities) (%)	Low engagement (0–2 CE activities) (%)
Sector				
Construction	46.5	53.5	75.8	24.2
Manufacturing	32.7	67.3	64.8	35.2
Retail/wholesale	39.4	60.7	58.4	41.6
Size				
Micro-sized enterprise	40.1	59.9	67.3	32.7
Small-sized enterprise	50.5	49.5	54.6	45.4
Medium-sized enterprise	76.6	23.5	79.6	20.4
Region				
Dublin	27.1	72.9	65.4	34.6
Other region	46.6	53.4	69.3	30.8
Year established				
Before 2014	47.1	52.9	70.0	30.0
2014 or later	38.8	61.3	64.9	35.1
B2B sales				
Less than 50% of revenue	37.3	62.7	65.0	35.0
50% or more of revenue	59.5	40.5	73.0	27.0
Export sales				
No	36.4	63.6	66.0	34.1
Yes	47.5	52.5	67.1	32.9

Total base (unweighted *n*) = 452. See Table A1.1 in Appendix 1 for details on subsample sizes (unweighted) by SME characteristic.

demand for CE products/services from business and international clients.

2.2 Trends in SME Engagement in the Circular Economy Over Time

To identify trends in CE engagement over time, responses to the questions on the five CE activities were compared with data from the European Commission's 2016 Flash Eurobarometer 441 survey, which also examined SME engagement in the CE.[6] This survey posed the same questions to 10,618 European SMEs, including 400 Irish SMEs, of which 34 were construction SMEs, 35 were manufacturing SMEs and 153 were retail/wholesale SMEs. For consistency, the trend analysis focuses on these three sectors, aligning with those covered in our SME survey. Furthermore, the data from both surveys are weighted according to the actual distribution of Irish SMEs (construction, manufacturing and retail/wholesale SMEs) by sector, size and region, enhancing the comparability of the results.

Table A1.4 in Appendix 1 shows the proportions of SMEs reporting various responses regarding their engagement in the five CE activities across the two surveys. A notable trend emerges, showing a decline in the percentage of SMEs that have implemented each activity, except for using renewable energy, along with a rise in the percentage of SMEs with activities either under way or planned. The decline in implementation is possibly linked to the challenging business environment Irish SMEs have faced in recent years, including the impacts of the COVID-19 pandemic, economic and trade disruptions from Brexit, and global uncertainties due to the war in Ukraine. However, it seems that Irish government policy and increased public focus on renewable energy have helped offset a decline in this area. Importantly, despite the drop in implementation, overall engagement seems to have improved when considering the combined percentages of SMEs with activities either implemented or under way, as well as those with activities in planning. Waste minimisation is the only area that has seen a decline in SMEs with activities implemented or under way, dropping from 74.2% in 2016 to 68.0% in 2024. This decline may reflect a shift away from a prior focus on recycling to other CE activities in recent years. Nevertheless, the large share of SMEs (22.4%) planning to implement waste minimisation activities suggests that it remains an area of focus for many SMEs.

To shed light on the types of SMEs with increased or decreased engagement in the various CE activities, Table 2.2 reports changes in the percentages of SMEs reporting that each of the five CE activities had either been implemented in the preceding 3 years or were under way, categorised by SME characteristic. Over 2016–2024, engagement increased across all SME types for using renewable energy and re-planning water usage. Additionally, all SME types, except those in the manufacturing sector, have increased engagement in re-designing products and services. In 2016, 61.7% of manufacturing SMEs had been engaging in this activity, compared with only 41.2% of construction SMEs and 37.3% of retail/wholesale SMEs.[7] The decline among manufacturing SMEs may stem from previously high levels of engagement, combined with recent business challenges, such as supply chain disruptions. Engagement in re-planning energy usage has increased among construction SMEs and micro- and small-sized enterprises, probably driven by rising energy costs. However, it has decreased among manufacturing SMEs, retail/wholesale SMEs and medium-sized enterprises, suggesting that these businesses are deprioritising energy planning amid other business challenges. Waste minimisation activities have also declined across all sectors, with the exception of construction, where waste management has become a critical issue.

2.3 Motivating Factors for SME Engagement in the Circular Economy

The factors that motivate SMEs to engage in the CE were examined by presenting respondents with eight potential motivating factors and asking them to indicate the extent to which each one motivates their company

6 Data from the European Commission's Flash Eurobarometer 441 survey can be accessed at https://data.europa.eu/data/datasets/s2110_441_eng?locale=en (accessed 23 June 2025).

7 See Tables A1.5 and A1.6 in Appendix 1 for the percentages of SMEs that reported engagement in each of the five CE activities in the European Commission's Flash Eurobarometer 441 survey (2016) and our SME survey (2024), respectively.

Table 2.2. Change in the percentage of SMEs reporting engagement in various CE activities, by SME characteristic: a comparison of the European Commission's Flash Eurobarometer 441 survey (2016) and our SME survey (2024)

SME characteristic	Re-designing products and services (%)	Minimising waste (%)	Using renewable energy (%)	Re-planning energy usage (%)	Re-planning of the way water is used (%)
Sector					
Construction	+29.1	+2.4	+62.8	+27.5	+5.7
Manufacturing	–5.2	–22.3	+51.2	–4.4	+24.4
Retail/wholesale	+16.1	–10.3	+34.5	–11.7	+20.7
Size					
Micro-sized enterprise	+19.5	–3.5	+49.2	+6.6	+14.8
Small-sized enterprise	+6.3	–39.9	+43.6	+3.2	+4.8
Medium-sized enterprise	+27.5	–9.8	+51.7	–9.0	+23.7

Engagement refers to activities that were either implemented or under way. For brevity, the CE activities are abbreviated; see Figure 2.3 for the full terms. The "+" and "–" symbols indicate an increase and decrease, respectively, over the period (2016–2024) between the two surveys. Total base (unweighted *n*) for our SME survey = 452. See Table A1.1 in Appendix 1 for details on subsample sizes (unweighted) by SME characteristic. Total base (unweighted *n*) from the European Commission's Flash Eurobarometer 441 survey = 222.

to engage in the CE. Figure 2.5 presents the results, showing that cost savings is the leading motivator, with 46.2% of SMEs reporting that it motivates their company to a high extent. Revenue generation (41.2%) and increased innovation in the economy (40.1%) also spur engagement to a high extent in many SMEs. Other relatively less influential factors include customer preferences, supplier willingness to

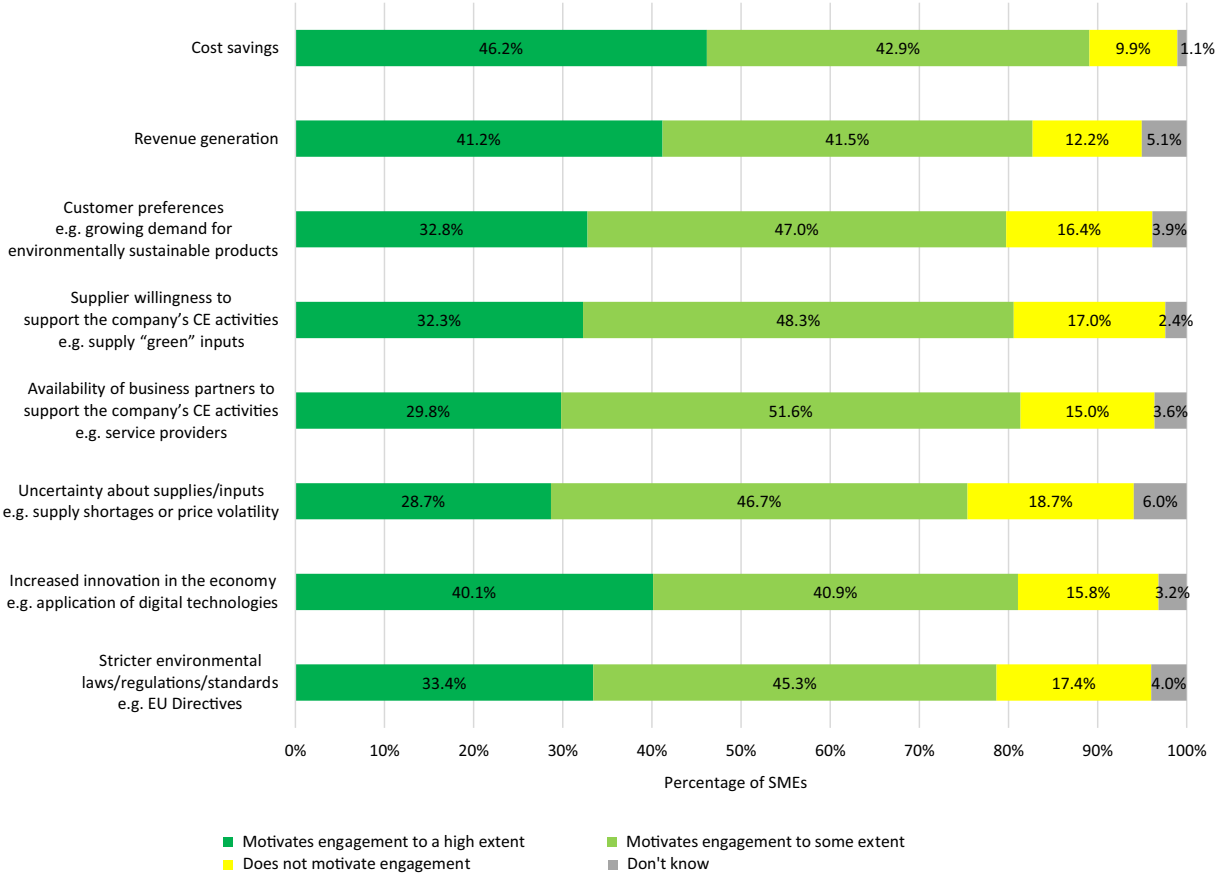

Figure 2.5. Motivating factors for SME engagement in the CE.

support CE activities, availability of business partners to support CE activities, uncertainty about supplies and inputs, and stricter environmental laws, regulations and standards. However, it is notable that, for most SMEs, all of the factors tend to motivate engagement to at least some extent.

To compare the importance of the various motivations, Table 2.3 ranks them using a Relative Importance Index (RII).[8] Based on this index, cost savings is the top motivator, followed by revenue generation, increased innovation in the economy, supplier willingness to support CE activities, customer preferences, stricter environmental laws, regulations and standards, availability of business partners to support CE activities, and uncertainty about supplies and inputs.

To shed light on differences in motivations, Table A1.7 in Appendix 1 shows the top three factors for different types of SMEs. While cost savings is the top motivator for many types of SMEs, other factors take precedence for certain types of companies. For manufacturing SMEs, supplier willingness to support CE activities is the leading motivator, reflecting the input-intensive nature of their operations and the critical need for a reliable stream of inputs. For retail/wholesale SMEs and those involved in exporting, revenue generation is the top driver, suggesting that these companies have a greater focus on sales and market expansion. For small-sized enterprises, customer preferences are the chief motivator, highlighting their reliance on close customer relationships to stay competitive, especially given their limited resources. The availability of business partners to assist with CE activities also ranks highly for these companies, again likely to be due to resource constraints. For medium-sized enterprises, stricter laws, regulations and standards is the primary motivator. This is likely to be because their larger operations make them more vulnerable to significant impacts from regulatory changes, coupled with the higher costs they face for non-compliance. Supplier willingness to support CE activities also ranks highly for these companies, probably due to the significant operational impacts they face if suppliers are unable to provide necessary resources. Notably, supplier support also ranks among the top three motivators for construction SMEs, newer SMEs, SMEs focused on B2B sales and SMEs that sell exclusively to the domestic market. Like manufacturing SMEs, construction SMEs are input intensive and rely on a steady stream of inputs to support their operations. Newer SMEs and those focused on domestic market sales are less likely to have strong supply chain relationships, making existing supplier support more critical. SMEs focused on B2B sales are predominantly construction and manufacturing SMEs, which, due

Table 2.3. RII results for the motivating factors for SME engagement in the CE

Motivator	RII score	RII ranking
Cost savings	0.676	1
Revenue generation	0.620	2
Increased innovation in the economy	0.606	3
Supplier willingness	0.564	4
Customer preferences	0.563	5
Stricter environmental laws/regulations/standards	0.560	6
Availability of business partners	0.556	7
Uncertainty about supplies/inputs	0.520	8

The RII ranges from 0 to 1. An RII score of 1 for a factor would indicate that all respondents reported the factor as motivating their company to engage in the CE to a high extent. Conversely, an RII score of 0 for a factor would indicate that all respondents reported the factor as not motivating their company to engage in the CE to any extent. For brevity, the motivating factors are abbreviated; see Figure 2.5 for the full terms. Total base (unweighted *n*) = 452.

8 This index assigns a weight of 2 to responses where a factor motivates a company to a high extent, 1 to responses where a factor motivates a company to some extent, and 0 to responses where a factor does not motivate a company, with "don't know" responses excluded. The weighted responses for each factor are summed and then transformed on to a 0–1 scale for easier interpretation. Higher scores indicate factors that are relatively more important for motivating CE engagement.

to their input-intensive operations, rely heavily on suppliers for business continuity.[9]

2.4 Perceived Barriers to SME Engagement in the Circular Economy

The perceived barriers to SME engagement in the CE were assessed by presenting respondents with 19 potential barriers and for each one asking them to indicate if it was a major barrier or minor barrier, not a barrier or if they did not know.[10] Figure 2.6 presents the results, highlighting several issues as major obstacles for many SMEs. These include uncertainty about the financial benefits of CE activities (37.8%), customer perceptions that CE products are of inferior quality (33.3%), low return on investment (ROI) for CE activities (32.8%), lack of customer demand for CE products and services (32.5%), lack of access to external finance (32.1%) and companies lacking knowledge about the CE (30.5%). Collectively, these barriers underscore financial-, market- and knowledge-related challenges, and may be viewed as systemic barriers rooted in our ties to the existing LE system.

Table 2.4 shows the relative importance of the various perceived barriers based on their RII ranking.[11] The barriers that are most inhibiting are the financial-, market- and knowledge-related challenges already mentioned. Barriers related to support conditions for CE activities, such as supplier willingness to support CE activities, product standards and regulatory challenges, rank lower. The least inhibiting barriers are ones internal to the SMEs, including a lack of appropriate technology/equipment, a lack of internal finance, risk aversion, viewing sustainability as a cost and not a saving, and prioritising profits over sustainability activities. Taken together, these findings point to a hierarchy of barriers, with systemic barriers tied to the LE being the most inhibiting, followed by support-related barriers and finally internal SME constraints.

To provide further insights, Table A1.8 in Appendix 1 shows the top three perceived barriers for different types of SMEs. While uncertainty about the financial benefits of CE activities is the leading perceived barrier for many types of SMEs, other challenges are more pressing for particular types of companies. For retail/wholesale SMEs, a lack of customer demand for CE products and services is the primary perceived barrier, reflecting their focus on sales and revenue generation. For small-sized enterprises, product standards present the biggest challenge, possibly due to knowledge limitations and a lack of expertise. A lack of long-term planning is also a key perceived barrier, possibly due to their focus on serving existing customers rather than seeking new business opportunities. In contrast, medium-sized enterprises are most inhibited by risk aversion within the organisations, probably due to the high potential losses they face if a new business venture fails. Prioritising profits over sustainability activities is also a key perceived barrier, highlighting their focus on financial performance. For SMEs based in Dublin, prioritising profits over sustainability, and viewing sustainability as a cost and not a saving, are among the main perceived barriers, possibly due to their higher cost base. A low ROI for CE activities is among the main perceived barriers for various SMEs, including construction SMEs, newer SMEs, micro-sized enterprises and those focused on B2B sales, highlighting their preference for more immediate financial returns over the long-term benefits offered by CE opportunities. A lack of access to external finance also ranks among the main perceived barriers for manufacturing SMEs, retail/wholesale SMEs and SMEs selling exclusively to the domestic market, suggesting that these businesses struggle to secure funds for CE engagement. For manufacturing SMEs,

9 In our weighted sample, SMEs generating 50% or more of their revenue through B2B sales are predominantly involved in construction (57.8%), followed by manufacturing (21.4%) and retail/wholesale (20.8%). In contrast, SMEs generating less than 50% of their revenue through B2B sales are primarily involved in retail/wholesale (50.0%), followed by construction (37.6%) and manufacturing (12.4%).

10 The survey focused on perceived barriers rather than experienced ones. Perception-based data are valuable for understanding SME decision-making, as they highlight the challenges businesses believe they face, which influence their actual CE engagement.

11 This index assigns a weight of 2 to responses where a barrier is reported to be a major barrier, 1 to responses where a barrier is reported to be a minor barrier, and 0 to responses where a barrier is reported not to be a barrier, with “don’t know” responses excluded. The weighted responses for each barrier are summed and then transformed on to a 0–1 scale for easier interpretation. Higher scores indicate barriers perceived to be more inhibiting to CE engagement.

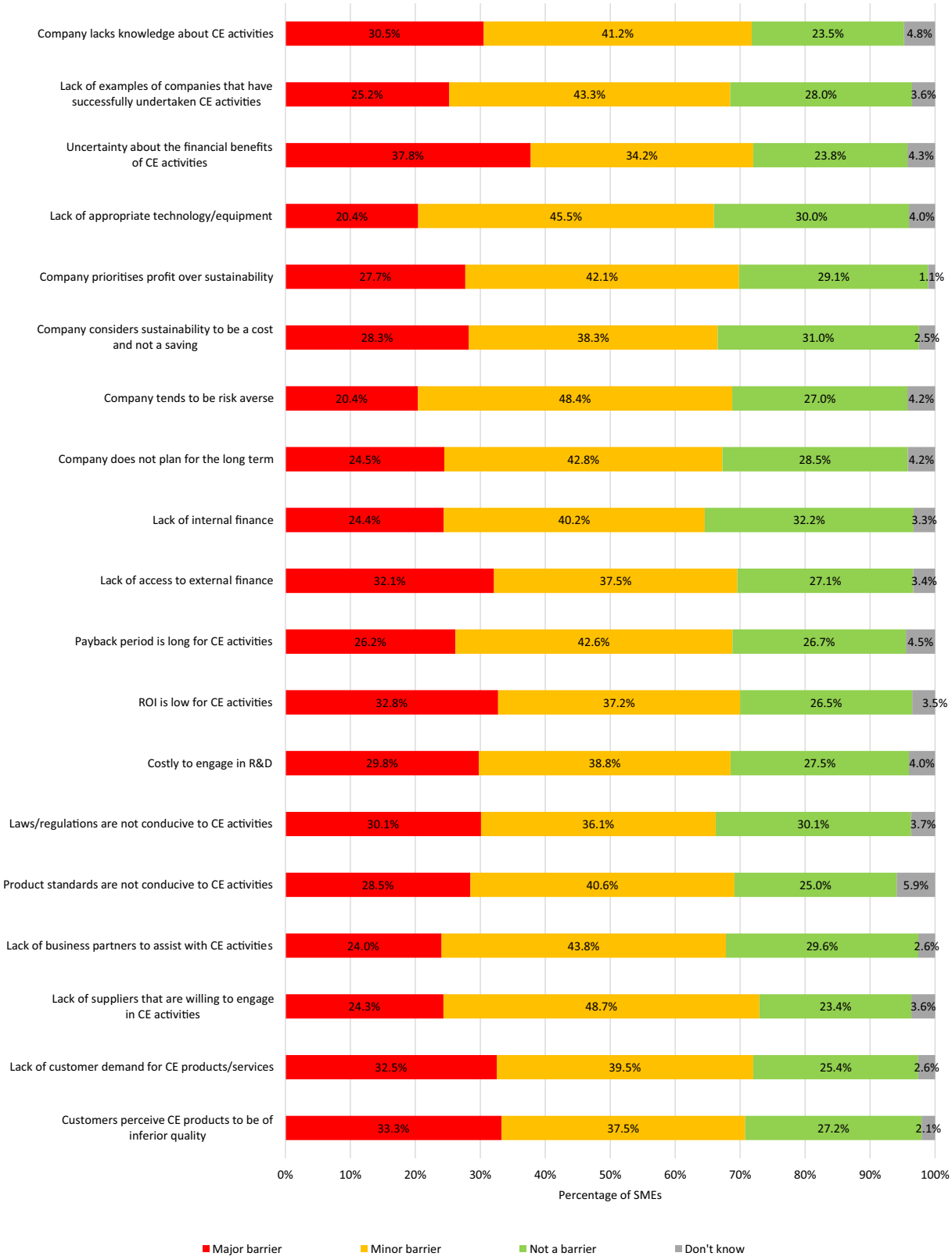

Figure 2.6. Perceived barriers to SME engagement in the CE.

the high cost of R&D is also a key perceived barrier, probably due to the complexity of CE engagement in this sector. A lack of knowledge about the CE also ranks among the main perceived barriers for retail/wholesale SMEs, micro-sized enterprises, older SMEs, SMEs based outside Dublin and those focused on B2C sales, highlighting their knowledge constraints and lesser focus on CE engagement. Product

Table 2.4. RII results for the perceived barriers to SME engagement in the CE

Barrier	RII score	RII ranking
Uncertainty about the financial benefits of CE activities	0.573	1
Company lacks knowledge about CE activities	0.537	2
Lack of customer demand for CE products/services	0.537	3
ROI is low for CE activities	0.532	4
Customers perceive CE products to be of inferior quality	0.531	5
Lack of access to external finance	0.526	6
Product standards are not conducive to CE activities	0.519	7
Costly to engage in R&D	0.512	8
Lack of suppliers that are willing to engage in CE activities	0.505	9
Laws/regulations are not conducive to CE activities	0.500	10
Payback period is long for CE activities	0.497	11
Company prioritises profit over sustainability	0.493	12
Company considers sustainability to be a cost and not a saving	0.486	13
Lack of examples of companies that have successfully undertaken CE activities	0.485	14
Company does not plan for the long term	0.479	15
Lack of business partners to assist with CE activities	0.471	16
Company tends to be risk averse	0.466	17
Lack of internal finance	0.460	18
Lack of appropriate technology/equipment	0.450	19

The RII ranges from 0 to 1. An RII score of 1 for a barrier would indicate that all respondents identified it as a major barrier, while a score of 0 would indicate that all respondents did not consider it a barrier. Total base (unweighted *n*) = 452.

standards pose a key challenge for construction SMEs, probably due to their extensive use of materials and their need to comply with quality and safety standards. Similarly, Dublin-based and newer SMEs also rank product standards among their main perceived barriers, possibly reflecting their focus on selling higher-quality LE goods in order to maximise profitability. Additionally, a lack of business partners is a significant barrier for medium-sized enterprises, while a lack of supplier support is a key issue for SMEs focused on B2B sales, suggesting that these businesses may see opportunities for CE engagement but are hampered by weak collaborations with partners and suppliers, respectively.

2.5 Perceived Barriers to SME Engagement in Various Circular Business Models

The survey also explored the perceived barriers to SME engagement in the six types of CBMs listed in Figure 2.1. Respondents were presented with a list of barriers specific to each CBM and were asked to indicate if each one was a major barrier or minor barrier, not a barrier or if they did not know. These barriers were assessed among SMEs that were either engaging, considering engaging or aware of opportunities to engage in the particular CBMs. In this section, the results are presented based on RII rankings, which show the relative importance of the various perceived barriers to engagement in each of the CBMs.[12] Results are shown for construction, manufacturing and retail/wholesale SMEs, respectively.

2.5.1 Using secondary raw materials

Table 2.5 presents the results on the perceived barriers to using secondary raw materials. The cost of these materials is the primary perceived barrier to their use among both construction and manufacturing SMEs, while it is also a key impediment for

12 The RIIs assign a weight of 2 to responses where a barrier to a CBM is reported to be a major barrier, 1 to responses where a barrier to a CBM is reported to be a minor barrier, and 0 to responses where a barrier to a CBM is reported not to be a barrier, with "don't know" responses excluded. The weighted responses for each barrier are summed and then transformed to a 0–1 scale for easier interpretation. Higher scores indicate barriers perceived to be more inhibiting to engagement in the relevant CBMs.

Table 2.5. RII rankings for the perceived barriers to using secondary raw materials, by sector

Barrier	RII ranking		
	Con	Man	R/W
Costly to buy these materials	1	1	2
Lack of access to these materials	2	4	3
Lack of knowledge on how to use these materials	7	5	4
Lack of technology/equipment to use these materials	8	7	8
Laws/regulations/standards are not conducive to using these materials	4	2	10
Lack of business partners to assist with the use of these materials	3	10	6
Uncertainty about the quality of these materials	5	9	5
Difficult to use these materials	10	8	1
Customer hesitancy about buying products made from these materials	6	3	9
Adverse impact on sales of new goods or other revenue steams	9	6	7

Total base (unweighted *n*) = Con (97), Man (151) and R/W (100).
Con, construction SMEs; Man, manufacturing SMEs; R/W, retail/wholesale SMEs.

retail/wholesale SMEs, indicating a widespread view that the materials are cost-ineffective. Access to the materials is another prominent issue across all sectors, particularly for construction and retail/wholesale SMEs.

Sector-specific perceived barriers are also evident. For construction SMEs, a lack of business partners to assist with the use of secondary raw materials is among the top barriers, highlighting the partnership-dependent nature of the sector, where collaboration with suppliers, contractors and service providers is crucial for the adoption of these materials. Regulatory challenges also rank highly for construction SMEs, reflecting the highly regulated nature of the sector, where compliance with safety and quality standards is crucial. Similarly, manufacturing SMEs also identify regulatory barriers as a significant challenge, suggesting that strict regulations or standards are hindering their adoption of the materials. Customer hesitancy about buying products made from secondary raw materials is another key perceived barrier for manufacturing SMEs, indicating concerns about market acceptance and customer demand. For retail/wholesale SMEs, the top perceived barrier relates to difficulties integrating the materials into their operations, which is not surprising, as secondary raw materials are more commonly associated with material-intensive sectors like construction and manufacturing.

Some other findings are also worth noting. For manufacturing SMEs, uncertainty about the quality of secondary raw materials, and difficulties using them, are among the lowest-ranked perceived barriers. This suggests that, while operational challenges related to quality and material usability may be significant in other sectors, they are less of a concern for manufacturing SMEs, possibly because these businesses already have the expertise or processes in place to work with such materials. In addition, internal SME barriers related to knowledge and technology/equipment rank lower across all sectors, suggesting that SMEs consider external barriers as more pressing.

2.5.2 Taking back old/used goods

Table 2.6 reports the results on the perceived barriers to taking back old/used goods, highlighting differences across sectors. For construction SMEs, a lack of business partners to assist with taking back construction materials is the top perceived barrier, reflecting the sector's dependence on collaboration with other companies for effective material recovery. A potential adverse impact on other revenue streams also ranks highly, highlighting concerns that takeback activities may divert resources away from more profitable operations. A lack of technology/equipment to take goods is another key perceived obstacle, further emphasising the need for partnerships to help manage the recovery and reuse of materials. For manufacturing SMEs, the top perceived barrier is that goods are difficult to take back. This is likely to be due to the nature of manufactured products and components that may not easily be returned or reused. Uncertainty about the quality of goods that would be taken back, as well as regulatory issues, are also key

Table 2.6. RII rankings for the perceived barriers to taking back old/used goods, by sector

Barrier	RII ranking		
	Con	Man	R/W
Costly to take back goods	7	9	3
Lack of knowledge on how to take back goods	8	7	4
Lack of knowledge on how to utilise the goods the company would take back	9	8	2
Lack of technology/equipment to take back goods	3	6	5
Laws/regulations/standards are not conducive to taking back goods	10	3	7
Lack of business partners to assist with taking back goods	1	10	8
Uncertainty about the quality of goods the company would take back	4	2	1
Goods are difficult to take back	6	1	6
Customers are unwilling to return goods	5	5	9
Adverse impact on sales of new goods or other revenue streams	2	4	10

Total base (unweighted *n*) = Con (107), Man (155) and R/W (111).
Con, construction SMEs; Man, manufacturing SMEs; R/W, retail/wholesale SMEs.

perceived barriers, suggesting that quality control and adherence to standards are significant concerns. For retail/wholesale SMEs, uncertainty about the quality of goods that would be returned also ranks as the primary perceived barrier. This is not surprising, as consumer goods often vary in quality and durability, making it difficult to assess whether returned items have residual value. A lack of knowledge on how to utilise returned goods presents another significant challenge, probably due to their focus on selling finished products. The cost of taking back goods is another key obstacle, likely to be related to the wide variety of products that retail/wholesale SMEs sell, which makes returns more complex and expensive to manage. A lack of established logistics systems and takeback infrastructure is also likely to add to the financial burden.

It is also worth noting some other findings. Knowledge-related barriers with respect to taking back and utilising returned goods are among the least inhibiting barriers for construction and manufacturing SMEs, suggesting that these companies already possess the expertise required to manage and reuse returned items. Unlike construction SMEs, manufacturing SMEs do not prioritise the need for business partners, suggesting that they have more internal capabilities or existing supply chain relationships that can better handle takeback logistics. For retail/wholesale SMEs, a potential adverse impact on sales of new goods is the least inhibiting barrier, which suggests that these businesses have a greater profit motive to engage in takeback schemes, provided other challenges can be addressed.

2.5.3 Providing repair/maintenance services

Table 2.7 presents the sectoral results on the perceived barriers to providing repair/maintenance services. For construction SMEs, the cost of parts and components is the top barrier, highlighting the expense of sourcing materials for repairs. Customer hesitancy about using repair/maintenance services is another key obstacle, reflecting preferences for buying new construction goods over repairing. The risk of goods malfunctioning after repair also ranks highly, probably because construction goods are expensive, with failures potentially resulting in significant financial consequences. For manufacturing SMEs, the cost of labour is the most pressing barrier, probably reflecting the specialised skills needed to repair and maintain manufactured goods. Customer hesitancy about using the services is another key barrier, highlighting a preference for new as opposed to repaired manufactured products. Difficulties repairing and maintaining goods also ranks highly, possibly because many manufacturing SMEs make components for products that may require disassembly to perform repairs. For retail/wholesale SMEs, the primary perceived barriers are a lack of knowledge on how to perform repairs/maintenance and a lack of technology/equipment. These issues are likely to stem from their primary focus on selling finished products rather than providing after-sales services, leaving them without

Table 2.7. RII rankings for the perceived barriers to providing repair/maintenance services, by sector

Barrier	RII ranking		
	Con	Man	R/W
Labour is costly for performing these services	5	1	11
Costly to buy parts/components	1	7	5
Lack of access to parts/components	6	8	9
Lack of knowledge on how to perform these services	7	10	1
Lack of technology/equipment to perform these services	9	4	2
Laws/regulations/standards are not conducive to providing these services	8	6	8
Lack of business partners to assist with these services	11	5	7
Goods are difficult to repair/maintain	10	3	4
Risk that repaired/maintained goods will malfunction	3	11	3
Customer hesitancy about using these services	2	2	6
Adverse impact on sales of new goods or other revenue streams	4	9	10

Total base (unweighted *n*) = Con (107), Man (155) and R/W (111).
Con, construction SMEs; Man, manufacturing SMEs; R/W, retail/wholesale SMEs.

the expertise or tools needed for repairs. The risk of repaired goods malfunctioning is also a key perceived barrier, possibly reflecting their limited knowledge and confidence in conducting repairs effectively.

Across sectors, it is also noteworthy that construction SMEs appear to face fewer challenges associated with internal resource constraints, with perceived barriers related to knowledge, technology/equipment, availability of business partners and difficulties in undertaking repairs ranking among the lowest. This is likely to reflect the nature of construction work, which often involves renovations and repairs.

2.5.4 Selling remanufactured/refurbished goods

Table 2.8 presents the sectoral results on the perceived barriers to selling remanufactured/refurbished goods. For construction SMEs, the risk of the goods malfunctioning is the top barrier, probably due to the high costs associated with product failure in this sector. The cost of parts and components is another critical barrier, highlighting the financial challenges these SMEs face in sourcing cost-effective materials. Customer hesitancy about buying the goods presents

Table 2.8. RII rankings for the perceived barriers to selling remanufactured/refurbished goods, by sector

Barrier	RII ranking		
	Con	Man	R/W
Labour is costly for remanufacturing/refurbishing goods	10	11	7
Costly to buy parts/components	2	2	10
Lack of access to parts/components	5	4	3
Lack of knowledge on how to remanufacture/refurbish goods	11	10	11
Lack of technology/equipment to remanufacture/refurbish goods	7	7	1
Laws/regulations/standards are not conducive to selling these goods	8	1	6
Lack of business partners to assist with remanufacturing/refurbishing	4	5	9
Goods are difficult to remanufacture/refurbish	6	9	8
Risk that remanufactured/refurbished goods will malfunction	1	6	5
Customer hesitancy about buying these goods	3	3	2
Adverse impact on sales of new goods or other revenue streams	9	8	4

Total base (unweighted *n*) = Con (94), Man (130) and R/W (106).
Con, construction SMEs; Man, manufacturing SMEs; R/W, retail/wholesale SMEs.

a further key obstacle, pointing to preferences for buying new as opposed to remanufactured/refurbished goods. For manufacturing SMEs, the top perceived barrier is a lack of conducive laws, regulations or standards, suggesting that regulatory compliance and product safety or industry standards are not well suited to selling remanufactured/refurbished goods. The cost of parts and components, along with customer hesitancy about buying the goods, are also key barriers, highlighting the impact of material costs and a lack of consumer trust in these goods. For retail/wholesale SMEs, a lack of technology/equipment is the leading barrier, probably reflecting the sector's focus on selling rather than manufacturing. Customer hesitancy about buying the goods is another significant obstacle, pointing to consumer trust issues with these goods. A potential adverse impact on sales of new goods also ranks highly for retail/wholesale SMEs, possibly due to the sector's tighter profit margins.

It is also notable that retail/wholesale SMEs do not seem concerned by barriers related to performing remanufacturing/refurbishing works, such as knowledge, costs, availability of business partners and difficulties associated with the works, probably reflecting their lower likelihood of performing these activities. While construction and manufacturing SMEs also do not appear to be particularly concerned about knowledge or complexity of the works, this is likely to be because of their existing expertise.

2.5.5 Selling second-hand goods

Table 2.9 reports the sectoral results on the perceived barriers to selling second-hand goods. For construction SMEs, the top perceived barrier is a lack of knowledge, probably stemming from their limited experience and involvement in the second-hand market for construction goods. A lack of access to second-hand goods is also a key perceived barrier, pointing to supply chain challenges and difficulties in sourcing quality used materials. Customer hesitancy about buying second-hand construction goods is another key perceived barrier, possibly linked to concerns about quality, reliability and warranty coverage. For manufacturing SMEs, a lack of business partners to assist with selling second-hand goods is the primary perceived barrier, possibly due to their reliance on established networks to facilitate resale. Unlike sectors that sell directly to consumers, manufacturing SMEs often depend on intermediaries to handle logistics and provide market access in terms of both acquiring and selling second-hand goods. Another key perceived barrier is the risk of second-hand goods malfunctioning, probably related to concerns about the quality of used goods. A potential adverse impact on sales of new goods presents a further significant barrier, which is unsurprising, given that manufacturing SMEs primarily generate revenue by producing new goods rather than reselling used ones. For retail/wholesale SMEs, the top perceived barrier is customer hesitancy about buying second-hand goods, probably reflecting

Table 2.9. RII rankings for the perceived barriers to selling second-hand goods, by sector

	RII ranking		
Barrier	Con	Man	R/W
Costly to acquire these goods	10	8	9
Lack of access to these goods	2	4	6
Lack of knowledge on selling these goods	1	6	10
Lack of technology/equipment to sell these goods	4	10	7
Laws/regulations/standards are not conducive to selling these goods	5	5	3
Lack of business partners to assist with selling these goods	8	1	8
Goods are not well suited to selling second hand	6	9	4
Risk that second-hand goods will malfunction	9	2	2
Customer hesitancy about buying these goods	3	7	1
Adverse impact on sales of new goods or other revenue streams	7	3	5

Total base (unweighted *n*) = Con (95), Man (130) and R/W (106).
Con, construction SMEs; Man, manufacturing SMEs; R/W, retail/wholesale SMEs.

preferences for buying new goods. The risk of second-hand goods malfunctioning presents a further significant obstacle. This is likely to be because retail/wholesale SMEs often sell a diverse range of products that can vary greatly in quality and durability, increasing the likelihood of returns and complicating their management. Another key perceived barrier relates to laws, regulations and standards not being conducive to selling second-hand goods, which again is likely to stem from the wide mix of products that retail/wholesale SMEs sell, with each potentially subject to different regulations and standards.

2.5.6 Leasing/renting goods (instead of selling goods)

Table 2.10 shows the results on the perceived barriers to leasing/renting goods (instead of selling goods). Across all sectors, the high upfront investment cost of buying goods that would subsequently be leased/rented is a key perceived barrier, ranking highest for manufacturing SMEs and second highest for construction and retail/wholesale SMEs. This is not surprising, as a leasing/renting model can require substantial capital investment, which may be beyond the financial capacity of many SMEs.

Sector-specific perceived barriers are also apparent. For construction SMEs, the risk of customers breaking contracts ranks as the primary perceived barrier, probably due to the high cost of construction goods, which may increase concerns about financial losses. The long payback period required to recoup the initial investment is also a key perceived barrier for construction SMEs, further emphasising financial challenges, particularly the strain that would be placed on cash flow. For manufacturing SMEs, goods not being suitable for leasing/renting is a key perceived barrier, probably because many manufacturers make components that cannot easily be leased/rented. The risk of customers breaking contracts is also a significant concern, possibly due to the high value and long-term nature of manufacturing contracts, which heightens exposure to financial losses. Retail/wholesale SMEs also face financial challenges, in terms of both high upfront costs and long payback periods, but they are more concerned about laws, regulations and standards not being conducive to leasing/renting goods. As already noted, these SMEs typically sell a broad mix of products, which complicates compliance with regulations and standards. To engage in leasing/renting, they may need extensive knowledge of regulations and standards to manage issues such as warranties and liability. Another key perceived barrier for retail/wholesale SMEs is goods not being suitable for leasing/renting, which is likely to reflect the short-lived or perishable nature of many types of retail goods.

Table 2.10. RII rankings for the perceived barriers to leasing/renting goods (instead of selling goods), by sector

	RII ranking		
Barrier	**Con**	**Man**	**R/W**
High upfront investment costs to buy goods to lease/rent	2	1	2
Long payback period	3	10	3
Lack of access to goods to lease/rent	9	6	6
Lack of knowledge on leasing/renting goods	10	7	8
Lack of technology/equipment to lease/rent goods	4	11	5
Laws/regulations/standards are not conducive to leasing/renting goods	8	5	1
Lack of business partners to assist with leasing/renting goods	7	4	7
Goods are not well suited to leasing/renting	11	2	4
Risk that customers will damage leased/rented goods	12	9	9
Risk that customers will break contracts	1	3	10
Customer hesitancy about leasing/renting goods	6	12	12
Adverse impact on sales of new goods or other revenue streams	5	8	11

Total base (unweighted *n*) = Con (97), Man (126) and R/W (80).
Con, construction SMEs; Man, manufacturing SMEs; R/W, retail/wholesale SMEs.

2.6 Policies/Interventions to Support SME Engagement in the Circular Economy

The role of policies/interventions in supporting SME engagement in the CE was examined by presenting respondents with 15 potential policies/interventions and asking them to indicate the extent to which each one would increase their company's willingness to engage in the CE. Figure 2.7 presents the results, highlighting several policies/interventions with potential to increase engagement to a high extent. These include reduced labour taxes (39.6%), increased use of standardised product design (39.4%), increased provision of CE training (37.7%), increased financial supports to invest in appropriate technology/equipment (36.5%) and a requirement to be engaged in CE activities in order to enter into public procurement contracts (35.6%). Notably, however, all measures are generally viewed positively by the respondents, highlighting the broad appeal of supportive policy actions.

To better compare the various policies/interventions, Table 2.11 ranks them using their RII score.[13] Based on this index, increased provision of CE

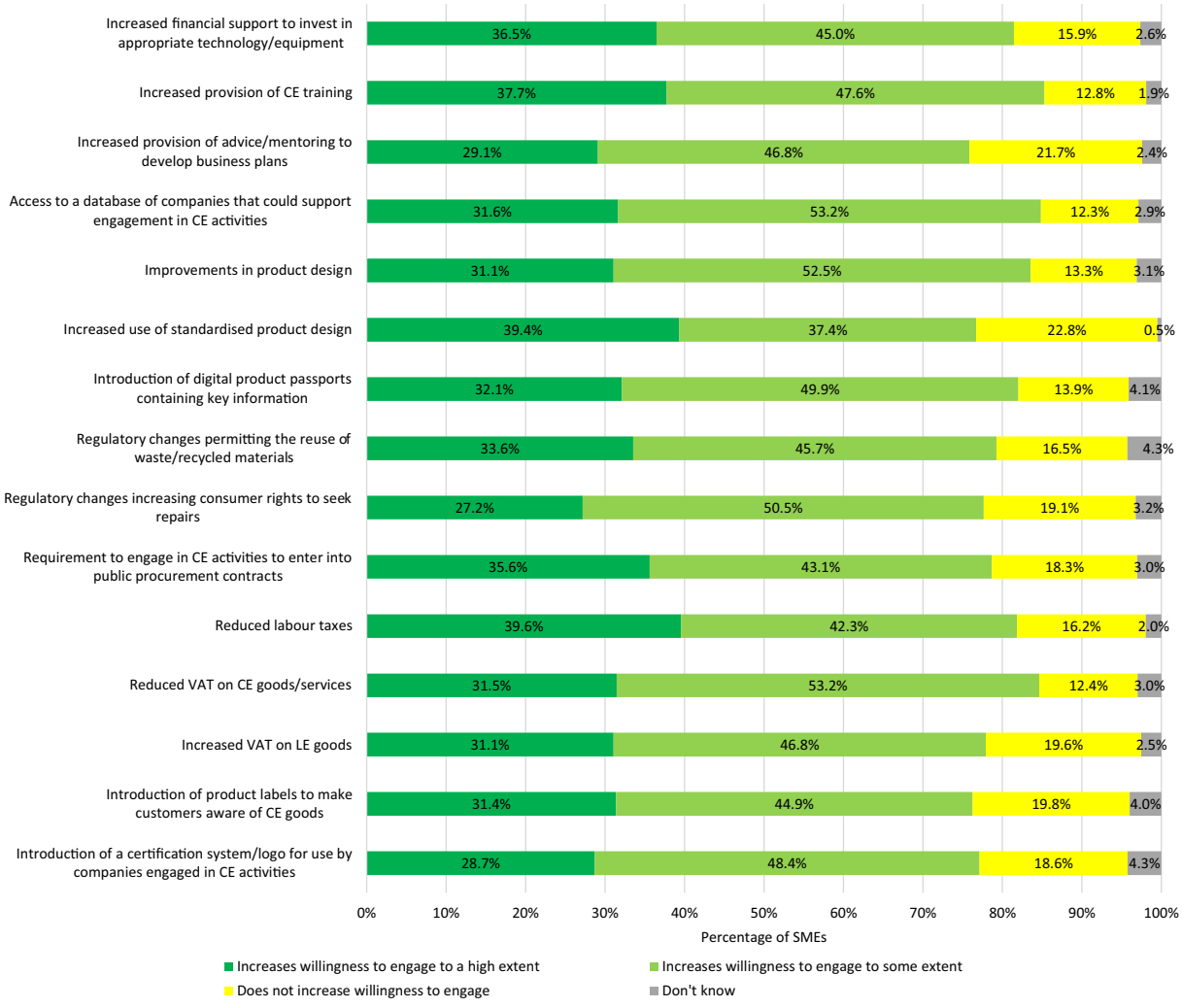

Figure 2.7. Potential policies/interventions for increasing SME engagement in the CE. VAT, value added tax.

13 This index assigns a weight of 2 to responses where a policy/intervention would increase a company's willingness to engage to a high extent, 1 to responses where a policy/intervention would increase a company's willingness to engage to some extent, and 0 to responses where a policy/intervention would not increase a company's willingness to engage, with "don't know" responses excluded. The weighted responses for each factor are summed and then transformed to a 0–1 scale for easier interpretation. Higher scores indicate policies/interventions that are relatively more important for increasing CE engagement.

Table 2.11. RII results for the policies/interventions for increasing SME engagement in the CE

Policy/intervention	RII score	RII ranking
Increased provision of CE training	0.627	1
Reduced labour taxes	0.619	2
Increased financial support to invest in appropriate technology/equipment	0.606	3
Access to a database of companies that could support engagement in CE activities	0.600	4
Reduced VAT on CE goods/services	0.598	5
Introduction of digital product passports containing key information	0.595	6
Improvements in product design	0.591	7
Requirement to engage in CE activities to enter into public procurement contracts	0.589	8
Regulatory changes permitting the reuse of waste/recycled materials	0.589	9
Increased use of standardised product design	0.583	10
Introduction of product labels to make customers aware of CE goods	0.561	11
Increased VAT on LE goods	0.559	12
Introduction of a certification system/logo for use by companies engaged in CE activities	0.553	13
Regulatory changes increasing consumer rights to seek repairs	0.542	14
Increased provision of advice/mentoring to develop business plans	0.538	15

The RII ranges from 0 to 1. An RII score of 1 for a policy/intervention would indicate that all respondents reported that it would increase their company's willingness to engage in the CE to a high extent. Conversely, an RII score of 0 for a policy/intervention would indicate that all respondents reported that it would not increase their company's willingness to engage in the CE to any extent. Total base (unweighted *n*) = 452.

VAT, value added tax.

training ranks highest, followed by reduced labour taxes and increased financial support to invest in appropriate technology/equipment, underscoring the importance of knowledge and financial supports. Digital innovations, including access to a database of companies that could support CE engagement and the introduction of digital product passports also rank highly. Mid-ranked measures include regulatory changes, such as requirements for CE engagement in public procurement contracts and permission to use waste/recycled materials, along with product-related interventions like improvements in product design and increased standardisation. Lower-ranked measures include those aimed at boosting consumer awareness though product labels for CE goods or a certification system/logo for CE-active companies, probably reflecting the current low levels of engagement in many CBMs. Notably, the lowest-ranked measure is the provision of advice/mentoring to develop business plans, which suggests that addressing the financial uncertainties of CE engagement requires more than standard advisory support.

To highlight differences in preferred policies/interventions, Table A1.9 in Appendix 1 displays the top three policies/interventions for supporting CE engagement among different types of SMEs. While increased provision of CE training ranks highest for many types of SMEs, other measures take precedence for certain types of companies. For manufacturing SMEs, the highest ranked measure is access to a database of companies that could support their CE engagement, which is not surprising given the input-intensive nature of their operations. This measure also ranks highly for construction SMEs, which are also input intensive. For retail/wholesale SMEs, reduced labour taxes ranks highest, possibly due to their tight profit margins and a likely need to employ additional and more highly skilled staff to engage in CBMs, while it also ranks highly for SMEs focused on B2C sales as well as those selling exclusively to the domestic market, probably due to the higher shares of retail/wholesale SMEs in these groupings.[14] For small-sized enterprises, improvements in product design is the highest ranked measure, possibly reflecting their knowledge limitations and lack of specialist skills.

14 In our weighted sample, SMEs that generate more than 50% of their revenue through B2C sales are primarily involved in retail/wholesale (50.0%), as opposed to construction (37.6%) or manufacturing (12.4%). SMEs that sell exclusively to the domestic market are also mainly involved in retail/wholesale (45.5%), as opposed to construction (41.8%) or manufacturing (12.7%).

This measure also ranks highest for SMEs involved in exporting and those focused on B2B sales, suggesting that product design challenges may be hindering their ability to effectively meet the demands of international and business clients. For SMEs located outside Dublin, increased financial supports ranks highest, probably reflecting their more limited revenue bases and financial resources. This also ranks highly among both small-sized enterprises and medium-sized enterprises, possibly due to their lower awareness of available financial supports, as well as the higher costs they may face when engaging in CBMs, relative to micro-sized enterprises. For older SMEs, the introduction of digital product passports emerges as the top-ranked measure, possibly due to their greater knowledge and latent capacity to engage in CBMs, as well as the higher proportion of manufacturing SMEs in this grouping.[15] It also ranks highly for export-oriented SMEs, probably due to the greater need for tracking CE products across global supply chains and ensuring compliance with varying regulations.

It is also notable that regulatory changes rank highly for both manufacturing and construction SMEs, with changes increasing consumer rights to seek repairs influential for manufacturing SMEs, probably due to the impact on product design, and changes permitting the reuse of waste/recycled materials important for construction SMEs, probably due to the high level of waste in the construction sector and the need for sustainable solutions. Additionally, a requirement to engage in CE activities to enter into public procurement contracts ranks highly for manufacturing and retail/wholesale SMEs, SMEs located outside Dublin and SMEs focused on B2B sales, highlighting its potential to boost CE engagement.

15 In our weighted sample, manufacturing SMEs account for 17.8% of older SMEs established before 2014, compared with 12.3% of newer SMEs established in 2014 or later.

3 Consumer Engagement in the Circular Economy

Consumer engagement in the CE was examined through a survey of 1035 Irish citizens, conducted over the period July–August 2024. The survey was administered online by a market research company (Dynata). Quota sampling was used to obtain a representative sample of the Irish general population by age, gender and region. The survey began by providing respondents with a definition of the CE, followed by sections covering various topics, including (1) consumer purchasing behaviours; (2) consumer awareness and knowledge of the CE; (3) consumer engagement with various CBMs; (4) perceived barriers to consumer engagement with various CBMs; and (5) respondent characteristics.

Summary statistics for the sample are provided in Appendix 2. Table A2.1 outlines the sample composition by respondent characteristic, while Table A2.2 compares it with the Irish general population using CSO 2022 Census data on age, gender and region. Overall, the sample closely aligns with the general population across these demographic characteristics. In terms of age, the sample is well balanced across individuals aged 35–54 years (40.1%), 55 years and over (33.3%) and 18–34 years (26.6%). Gender distribution also aligns with the general population with females (54.4%) slightly outnumbering males (45.6%). Regional representation is also evenly distributed, with Dublin (30.4%) accounting for the largest share of respondents, followed by the South-West (15.3%) and Mid-East (13.9%). Table A2.1 also provides breakdowns of the respondents by household income, educational attainment and urban/rural location, with the sample broadly reflecting the Irish general population across these demographics, based on the CSO's 2022 Survey on Income and Living Conditions and the 2022 Census.[16] Across the household income categories, the sample is evenly spread, with similar shares of respondents having annual gross incomes of less than €32,075 (26.5%), €32,075–55,034 (26.0%), €55,035–85,507 (25.4%) and over €85,507 (22.1%). A large share of respondents have third-level qualifications or higher (62.4%), while most live in urban areas, including cities (31.1%) and small (15.8%) and mid-sized towns (25.7%).

3.1 Consumer Purchasing Behaviours

In the survey, the respondents were presented with a list of 12 product types and asked to select those they had purchased in the last 12 months. Table A2.3 in Appendix 2 lists the product types, their descriptions and the percentages of respondents who selected each one. The most commonly purchased product types were informal (95.6%) and formal (72.3%) clothing/footwear, small/handheld kitchen appliances (76.6%), home furnishings (72.2%), handheld/wearable personal electronic devices (63.1%) and home furniture (53.0%). Others less frequently purchased included children's clothing/ footwear (50.1%), building products (44.5%) and home electronic appliances/devices (44.9%). The least frequently purchased product types were large (20.4%) and small/handheld (35.2%) power tools, and large kitchen appliances (31.8%). To facilitate a product-level analysis of consumer engagement with different CBMs, the respondents were also asked to indicate the top five product types they had purchased most frequently in the last 12 months. Those who had purchased fewer than five product types selected all product types they had bought. The percentages of respondents who selected each product type are shown in Table A2.4 in Appendix 2.

To understand the types of businesses consumers purchase from, respondents were asked to indicate the percentage of their purchases from SMEs and local retailers, based on their most frequently purchased product types. Tables A2.5 and A2.6 in Appendix 2 show that most consumers buy some (rather than none or all) of the product types from

16 The 2022 Survey on Income and Living Conditions data on Irish household incomes are available at https://www.cso.ie/en/releasesandpublications/ep/p-silc/surveyonincomeandlivingconditionssilc2022/ (accessed 25 June 2025); the 2022 Census data on educational attainment and urban/rural residence can be accessed at https://www.cso.ie/en/statistics/population/censusofpopulation2022/ (accessed 25 June 2025).

SMEs and local retailers, respectively. However, certain product types appear to be more frequently purchased from these businesses, with notable shares of consumers buying all of their large power tools, large kitchen appliances and building products from SMEs (25.9%, 23.7% and 21.7%, respectively) and from local retailers (36.2%, 41.7% and 39.1%, respectively). In contrast, other product types, such as formal, informal and children's clothing/footwear, and handheld/wearable personal electronic devices, are less frequently purchased exclusively from SMEs (7.6%, 7.4%, 6.3% and 8.8%, respectively) and local retailers (16.3%, 17.4%, 16.6% and 19.5%, respectively).

3.2 Consumer Awareness and Knowledge of the Circular Economy

To examine consumer awareness and knowledge of the CE, respondents were asked if they knew what was meant by the term "circular economy". Figure 3.1 presents the results, which highlight a low level of awareness and knowledge among consumers, with few respondents (8.3%) indicating that they have good knowledge about the CE and just over one-third (35.6%) reporting that they have some knowledge. Most respondents indicated that they did not know what was meant by the term, with most never having heard of it (30.1%) and some having heard of it but not knowing what it means (26.0%).

To further explore consumer CE awareness and knowledge, respondents were asked to indicate the extent to which they perceived a link between various CE behaviours and climate change. Despite limited familiarity with the CE term, many respondents indicated that they could see a clear link or some link between these behaviours and climate change. Figure 3.2 shows that a clear link was most commonly perceived for returning old/used products to businesses via takeback schemes (59.5%), followed by repairing a product (58.1%) and buying a remanufactured/refurbished (53.1%) or second-hand product (54.3%), instead of buying a new item. Leasing/renting a product rather than buying a new one was less frequently perceived as having a clear link with climate change (36.2%). In general, the results suggest that consumers tend to understand the environmental implications of CE behaviours, even if they are not familiar with the formal CE terminology.

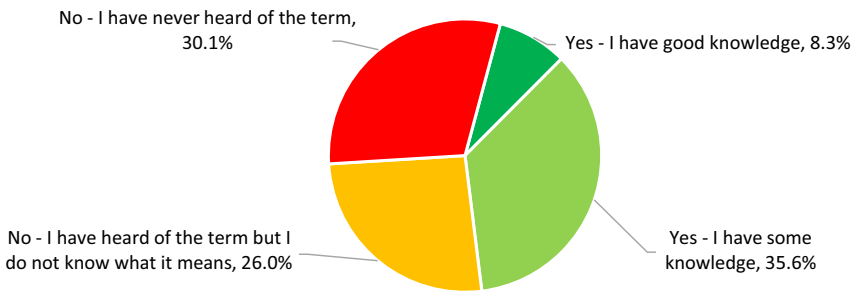

Figure 3.1. Consumer awareness and knowledge of the CE.

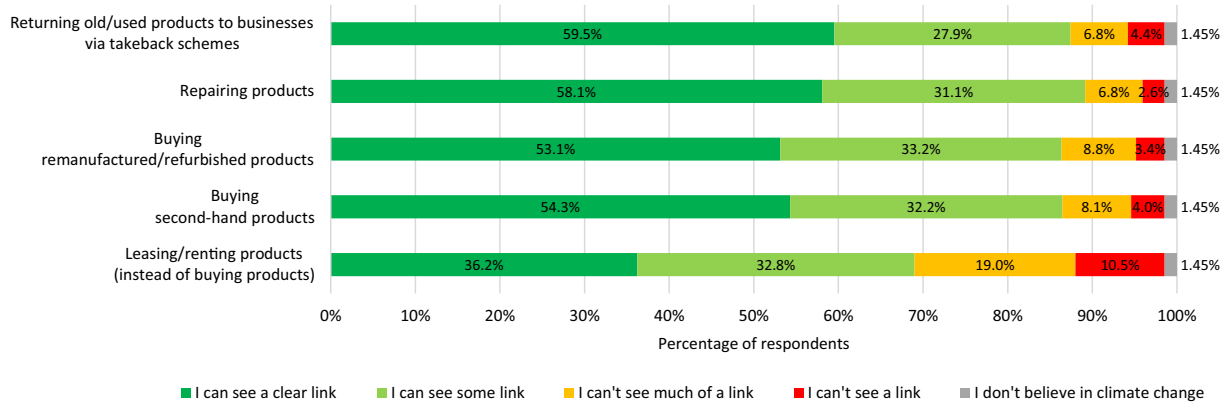

Figure 3.2. Consumer perceptions of the link between various CE behaviours and climate change.

3.3 Consumer Engagement with Various Circular Business Models

Consumer engagement with various CBMs was assessed by asking the respondents if they had ever engaged in or were willing to engage in specific behaviours associated with five different types of CBMs. Specifically, they were asked if they had ever or were willing to (1) return old/used products to businesses via takeback schemes, (2) repair products (through either self-repair or professional repair services), (3) purchase remanufactured/refurbished products, (4) purchase second-hand products, and (5) lease/rent products (instead of buying products). The results, presented in Table A2.7 in Appendix 2, reveal a high willingness to engage with all CBMs, particularly those involving takeback schemes (97.4%) and repairs (93.5%), but also buying remanufactured/refurbished (88.2%) and second-hand (85.3%) products. Remarkably, many consumers have never even once engaged with the various CBMs, with just over half reporting that they have returned an old/used product to a business via a takeback scheme (56.2%) or purchased a remanufactured/refurbished product (51.7%), and just over one-third reporting having ever leased/rented a product (36.4%). However, the difference between respondents' past engagement with the CBMs and their willingness to engage points to an intention–behaviour gap and a latent underlying demand for CE products and services, particularly for takeback schemes (41.2%) and remanufactured/refurbished products (36.5%).

Consumer willingness to engage with the various CBMs was further assessed by asking respondents who were willing to engage if their engagement would depend on the product type. As illustrated in Figure 3.3, willingness to engage is strongly influenced by product type, with high shares of respondents indicating that they would be willing to engage with the various CBMs only for certain types of products, especially the CBMs involving repairs (52.4%) and second-hand (54.9%) and remanufactured/refurbished products (52.0%). Notably, however, a large share (61.6%) of respondents expressed a willingness to return all types of products via takeback schemes. In contrast, only a small proportion (16.1%) are willing to lease/rent all types of products.

To examine how product type influences consumer willingness to engage with CBMs, Table A2.8 in Appendix 2 reports the percentages of respondents willing to engage with various CBMs, by product type. The percentages are based on respondents who selected a product type among the top five they most frequently purchased in the last 12 months. Willingness to engage with takeback schemes is consistently high across all product types, particularly large (88.2%) and small/handheld power tools (83.8%), and small/handheld kitchen appliances (83.3%). Similarly, willingness to engage in repairs is also generally high, particularly for home electronic appliances/devices (85.2%), small/handheld power tools (81.6%) and handheld/wearable personal electronic devices (81.0%). While willingness to buy second-hand and remanufactured/refurbished products is low for some product types, it is high for home furniture (76.7% and 82.6%, respectively) and large power tools (77.4% and 77.8%, respectively). Remanufactured/refurbished products also tend to be popular for purchases of small/handheld power tools (81.4%) and handheld/wearable personal electronic devices (80.3%). In contrast, willingness to lease/rent products is low for many product types, although it is high for large (88.9%) and small/handheld power tools

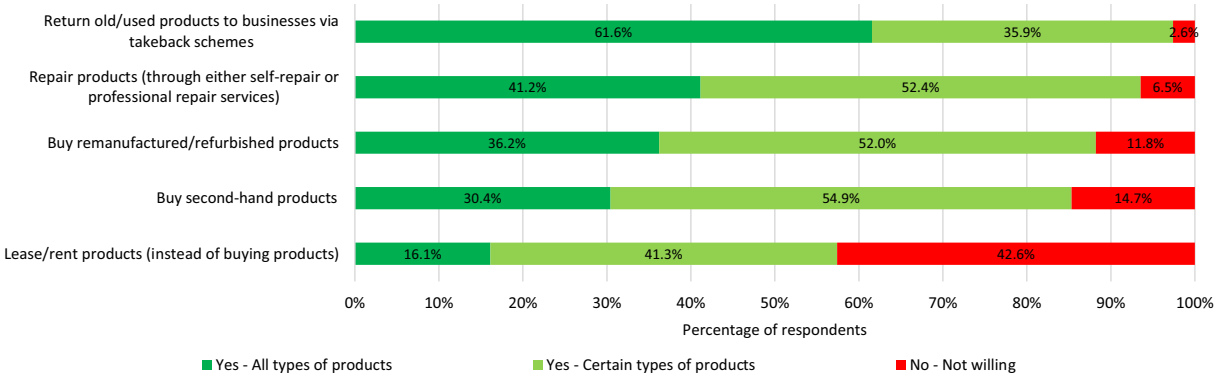

Figure 3.3. Consumer willingness to engage with various CBMs.

(77.1%), home electronic appliances/devices (67.7%) and formal clothing/footwear (58.6%).

3.4 Perceived Barriers to Consumer Engagement with Various Circular Business Models

The perceived barriers inhibiting consumers from engaging with various CBMs were assessed by presenting respondents with lists of potential barriers to their engagement in each of the five CBMs listed in Figure 3.3 and for each barrier asking them to indicate the extent to which it inhibits their engagement with the particular CBM. In this section, the results are discussed based on RII rankings, which reveal the relative importance of the various perceived barriers to engagement with each CBM.[17]

3.4.1 Returning old/used products to businesses via takeback schemes

Table A2.9 in Appendix 2 reports the results on the perceived barriers to engagement with takeback schemes. Convenience and awareness emerge as the primary obstacles, including difficulties in transporting large items, lack of drop-off points, absence of collection services and limited awareness about takeback schemes. Barriers related to incentives and costs, including a lack of rewards for returning products and the need to pay to do so, are also important. Concerns about data privacy and the need to clean items before returning them are relevant for some consumers but are less significant than the more practical barriers. Consumer preferences for keeping products for sentimental reasons or for future use are the least inhibiting overall.

3.4.2 Repairing products (through either self-repair or professional repair services)

The results on the perceived barriers to repairing products through self-repair and professional repair services are reported in Appendix 2 in Tables A2.10 and A2.11, respectively. For self-repair, the primary perceived barriers relate to resource and knowledge constraints, including limited access to parts, lack of repair skills and uncertainty about repair feasibility. Other practical challenges, such as difficulties in disassembling products and a lack of tools and manuals, also pose barriers, albeit to a lesser extent. Concerns about safety/fire risks, repair reliability and hygiene rank lower, while a preference for new goods and constraints on time to perform repairs are the least prominent perceived barriers. In relation to professional repair services, cost and convenience emerge as the main barriers, including the cost of repair services, the low price difference relative to purchasing new goods, difficulties in transporting large goods, and uncertainty about whether goods can be repaired easily and cheaply. A lack of availability of repair services, as well as a lack of assurances about repair reliability, including the absence of warranties with repairs and the potential for future problems, also present issues but are less significant. Practical considerations, such as the time required to organise and wait for repairs, along with concerns about safety, data privacy and repair quality, rank lower, while a preference for new goods and hygiene concerns are the least prominent obstacles.

3.4.3 Purchasing remanufactured/refurbished products

Table A2.12 in Appendix 2 reports the results on the perceived barriers to buying remanufactured/refurbished products, which largely mirror that of second-hand products but with some differences. Similar to second-hand products, product reliability and quality concerns are the primary perceived barriers, including a lack of warranties and the likelihood of problems. Uncertainty about product quality and low price differences relative to new products also rank highly. Similarly, concerns about product safety, hygiene and data privacy issues for certain types of products are less significant. However, in contrast to second-hand products, a lack of availability of remanufactured/refurbished products ranks higher and is among the main perceived barriers, while concerns about product safety risks rank lower. Practical challenges in terms of the time

17 The RIIs assign a weight of 2 to responses where a barrier is reported to inhibit engagement to a high extent, 1 to responses where a barrier to a CBM is reported to inhibit engagement to some extent, and 0 to responses where a barrier to a CBM is reported not to inhibit engagement. The weighted responses for each barrier are summed and then transformed on to a 0–1 scale for easier interpretation. Higher scores indicate barriers perceived to be more inhibiting to engagement with the particular CBMs.

required to source the products and a lack of delivery services, along with a preference for new goods, remain the least significant perceived barriers.

3.4.4 Purchasing second-hand products

Table A2.13 in Appendix 2 reports the results on the perceived barriers to purchasing second-hand products. Concerns about product reliability and quality are the main perceived barriers, including a lack of warranties, the likelihood of problems with second-hand products and uncertainty about their quality. Price difference relative to new products is also an issue, with many consumers perceiving little financial advantage. A lack of availability of second-hand products, and concerns about safety, hygiene and data privacy for certain types of products, are also relevant but less significant. The least inhibiting barriers are practical challenges, such as the time required to source second-hand products and a lack of delivery services, along with a preference for new goods.

3.4.5 Leasing/renting products (instead of buying products)

The results on the perceived barriers to leasing/renting products (instead of buying products) are reported in Table A2.14 in Appendix 2. Availability and price are the primary barriers, with a lack of leasing/renting services and low price differences relative to buying new products being the most significant issues. Hygiene concerns and a preference for new as opposed to leased/rented products also rank highly, notably more so than for repaired, second-hand and remanufactured/refurbished items. Product reliability in terms of the likelihood of problems with products and a lack of warranties also poses an issue, although uncertainty about quality is a lesser concern. Other barriers, including the time required to source leased/rented products, delivery services, and concerns about data privacy and safety risks for certain product types, are less significant.

3.5 Role of Consumer Characteristics in Circular Economy Awareness, Knowledge and Engagement

To explore the link between consumer characteristics and understanding about the CE, the results from the question eliciting respondents' comprehension of the term "circular economy" are reported in Table A2.15 in Appendix 2, categorised by respondent characteristic. While knowledge of the term is low across all consumer cohorts, it is generally higher among people with increased socioeconomic status and living in more affluent areas, such as individuals in the highest income households, those educated to third level or higher, Dublin residents and urban dwellers, with all of these groups having higher shares of respondents with good knowledge (15.3%, 10.5%, 10.5% and 10.1%, respectively). Proportionally more males (10.0%) and young adults aged 18–34 years (9.8%) also report having good knowledge, compared with females and older adults, respectively. Awareness of the CE term is lowest among those without third-level qualifications and in the lowest-income households, with high shares of these groups never having heard of the term (39.3% and 37.2%, respectively), further highlighting the link between socioeconomic status and CE awareness.

To provide a sense of how consumer characteristics influence engagement with CBMs, the results from the questions on respondents' willingness to engage in the behaviours associated with each of the five CBMs (listed in Figure 3.3) are reported in Table A2.16 in Appendix 2, categorised by respondent characteristic. The results show the percentages of respondents who are willing to engage in each CBM for all product types they buy. Despite individuals with higher socioeconomic status having a better understanding of the CE term, individuals with lower socioeconomic status are generally more willing to engage with CBMs, such as individuals from lower-income households who are more willing to engage with all CBMs, and particularly with second-hand and remanufactured/refurbished products. Younger people, who typically face greater income constraints, are also more inclined to engage with most CBMs, except takeback schemes, which older people may have more experience with. People living outside Dublin, in less affluent regions, also show a higher willingness to engage with most CBMs, except leasing/renting services, which may be more readily available in Dublin. The effect of socioeconomic status wanes, however, among better-educated individuals and urban dwellers, who are generally more willing to engage with CBMs. This may be due to better knowledge about the CE among those with

third-level qualifications and increased access to CE products and services in urban areas. One exception is that better-educated people tend to be less willing to purchase remanufactured/refurbished products, which is possibly due to misperceptions about these products.

4 Policies/Interventions to Support SME Engagement in the Circular Economy

This chapter synthesises the findings from Chapters 2 and 3 to provide recommendations on polices and interventions that can effectively support SME engagement in the CE. It begins by outlining general policies and interventions for supporting SME engagement, followed by specific recommendations tailored towards various CBMs, including (1) using secondary raw materials, (2) taking back old/used goods, (3) providing repair/maintenance services, (4) selling remanufactured/refurbished goods, (5) selling second-hand goods and (6) leasing/renting goods (instead of selling goods).

4.1 General Policies/Interventions to Support SME Engagement in the Circular Economy

- As highlighted in Chapter 2, SMEs exhibit low levels of engagement in the CE, especially when it comes to CBMs, which require more complex changes to business operations than other CE activities. A greater policy focus on CBMs is needed to drive adoption of these models, which are critical for a functioning CE.
- Nearly all SMEs that are not currently engaging in CBMs are unaware of opportunities that may be available to them, as highlighted in Chapter 2. Policymakers need to focus on raising awareness of CE opportunities, as without this many businesses are unlikely to get involved.
- Although many SMEs are not currently engaging in or aware of opportunities to engage in CBMs, some are considering adopting these models, indicating an openness to engage, as shown in Chapter 2. To drive CBM adoption, policy efforts should focus on addressing the specific barriers to engagement with various CBMs, as per the recommendations outlined in section 4.2.
- As noted in Chapter 2, SME engagement in the CE tends to increase with participation in multiple CBMs or CE activities, suggesting a spillover effect whereby initial participation fosters further involvement. Policies promoting CE engagement could capitalise on this trend by integrating supports across various CBMs or other CE activities. For example, initiatives to promote takeback schemes could be combined with support for repair services or the sale of second-hand or remanufactured/refurbished goods. Similarly, measures encouraging the use of secondary raw materials could be complemented by support for selling remanufactured goods.
- The perceived barriers to CE engagement are many and varied and differ by CBM and sector, as shown in Chapter 2. However, the primary perceived barriers to CE engagement in general appear to follow a hierarchy, with systemic barriers (financial-, market- and knowledge-related challenges) the most pressing, followed by support-related barriers (supplier, product and regulatory issues) and internal SME constraints (related to technology/equipment, internal finance and attitudes towards risk and sustainability). While all perceived barriers require policy attention, addressing the systemic barriers first is essential to achieving meaningful returns from measures that improve the supportive environment for CE activities or enhance the capacity of SMEs to engage.
- Measures aimed at increasing knowledge and providing training on the CE are crucial for enhancing SME engagement, given that a lack of knowledge is one of the main barriers to CE participation, and the provision of training is the CE support most preferred by SMEs, as highlighted in Chapter 2. Scaling up Skillnet Ireland to provide industry-specific CE training across key sectors is one possible solution to address these needs. Incorporating CE-focused modules in third-level education, such as in business and environmental science courses, would also help build a more informed workforce. Similarly, educational interventions in schools could further improve CE skills in the economy and foster positive CE attitudes from an early age.
- Market-related barriers are a key impediment to SME engagement in the CE. As highlighted in Chapter 2, a lack of customer demand for

CE products and services is among the main barriers to CE engagement, aligning with the findings reported in Chapter 3, where it was shown that many consumers have never previously engaged with CBMs. However, as also highlighted in Chapter 3, many consumers are willing to engage with CBMs, provided that opportunities are available to them, pointing to an intention–behaviour gap and a latent underlying demand for CE products and services. For policymakers, it is crucial to communicate this underlying demand to SMEs, for example through industry-specific events and advisory services. Policymakers should also focus on incentivising consumers to engage with CBMs in order to enhance the business case for SMEs to adopt these models. Increasing consumer awareness and knowledge about the CE is a necessary step, given their current low levels of understanding, as highlighted in Chapter 3. Public information and awareness campaigns should therefore be considered a priority. The introduction of product labels for CE products would also be likely to help once consumers become more CE aware. The government could also help to generate a more immediate demand for CE products and services by incorporating CE criteria in green public procurement contracts. However, for sustained CE success, measures that improve the attractiveness of CE products and services, for example by reducing their cost or enhancing their convenience, are essential, as outlined in the recommendations in section 4.2.

- Financial considerations are central to decisions made by SMEs on the CE. As shown in Chapter 2, uncertainty about the financial benefits of CE activities is the primary barrier to CE engagement in general, while the low ROI for CE activities and a lack of access to external finance also play significant roles. SME motivations for engaging in the CE are also primarily driven by financial factors, including cost savings and revenue generation. Policies and interventions that improve the financial appeal of CE engagement are therefore likely to positively influence participation. Potentially effective measures could include offering financial incentives in the form of reduced labour taxes, lower taxes on CE goods/services, and increased financial assistance for investments in technology and equipment, which rank highly among the CE policies and interventions preferred by SMEs. However, the success of these measures may depend on complementary measures that address other key barriers to CE engagement, such as the knowledge- and market-related challenges previously mentioned.
- As noted, uncertainty about financial benefits is the barrier most inhibiting to SME engagement in the CE. Policymakers could take this into account when designing initiatives to improve CE awareness or knowledge by providing projections on cost reductions and revenue generation, thus enabling SMEs to make more informed decisions. However, it is crucial that policymakers do not over-rely on conventional advisory supports, such as the provision of advice or mentoring for business plan development, which is the measure least preferred by SMEs for supporting their CE engagement, as shown in Chapter 2. Instead, the focus should be on ensuring more predictable financial benefits by prioritising the resolution of the systemic barriers to CE engagement.
- A lack of external finance is a factor that inhibits SMEs from engaging in the CE, as noted in Chapter 2. To address this, policymakers should provide more financial supports for CBM engagement, possibly by expanding the Circular Economy Innovation Grant Scheme or Enterprise Ireland's Green Start and Green Plus schemes. However, given the scale of economic transformation required to transition to a CE, and the need to raise awareness, administering financial supports through a fund specifically dedicated to the CE would be advisable.
- Increased innovation in the economy is an important motivation for SME engagement in the CE, as outlined in Chapter 2. For policymakers, measures such as the introduction of digital product passports, improvements in product design and the development of databases of companies that could support SMEs' CE activities all hold potential to boost CE engagement, ranking highly among the CE policies and interventions preferred by SMEs, as shown in Chapter 2.
- The willingness of supplier businesses to support the CE activities of SMEs is an important driver of CE participation for certain types of SMEs, including manufacturing SMEs and medium-sized enterprises, as shown in Chapter 2. Policies and interventions that support the supply of circular

materials and the number of suppliers offering such materials would help to spur CE engagement among these SMEs.

- SME engagement in the CE varies based on specific SME characteristics, as highlighted in Chapter 2, with greater engagement observed among construction SMEs, medium-sized enterprises, SMEs based outside Dublin, older SMEs, B2B-focused firms and exporters. Policies and interventions aimed at addressing the barriers to CE engagement for these SMEs may yield the most substantial returns in terms of increasing CE activity in the economy. In contrast, retail/wholesale and manufacturing SMEs, micro- and small-sized enterprises, Dublin-based SMEs, younger SMEs, B2C-focused firms and non-exporters show lower levels of CE engagement and are likely to require more significant incentives to engage in the CE.

4.2 Specific Policies/Interventions to Support SME Engagement in Various Circular Business Models

4.2.1 Using secondary raw materials

- As highlighted in Chapter 2, the cost of secondary raw materials is the main perceived barrier to their use, particularly for construction and manufacturing SMEs. Policy efforts must therefore prioritise cost-reduction measures, like reducing value added tax (VAT) on these materials. Increasing VAT on virgin raw materials could further incentivise a shift towards secondary raw materials.
- Access to secondary raw materials is another key obstacle to their use, particularly for construction and retail/wholesale SMEs, as noted in Chapter 2. To address this, measures that increase the supply of these materials should be prioritised, such as investing in recycling infrastructure and facilities that process and supply secondary raw materials, broadening extended producer responsibility schemes to include new waste streams, incentivising product takeback schemes among businesses, and creating digital platforms to connect suppliers and buyers of the materials.
- Regulatory issues impede the use of secondary raw materials, particularly for manufacturing and construction SMEs, as noted in Chapter 2. Policymakers could help to alleviate these issues by streamlining regulations that govern the use of secondary raw materials, establishing clear guidelines and quality standards, and providing advisory services to help SMEs navigate the legal requirements related to these materials.
- In the construction sector, a lack of business partners to assist with the use of secondary raw materials is a major challenge, as shown in Chapter 2. Measures that encourage businesses to enter into the secondary raw materials market should be a priority. Providing SMEs with support to help them identify potential partners could further alleviate this issue.

4.2.2 Taking back old/used goods

- As explained in Chapter 2, SMEs face significant challenges in managing takeback activities themselves. Construction SMEs are hindered by a lack of business partners, inadequate technology/equipment and potential adverse impacts on their profits. Manufacturing SMEs struggle with the complexity of taking back goods that cannot easily be taken back, while also having concerns about their quality. Retail/wholesale SMEs are similarly deterred by quality concerns, as well as a lack of knowledge on how to reuse goods and cost-related issues. In the light of these significant challenges, policymakers should consider incentivising intermediary businesses or social enterprises to manage the collection, dismantling, sorting and handling of materials, by offering start-up grants or other financial supports. Public–private partnerships should also be explored as a means to engage intermediaries in this aspect of the CE.
- As highlighted in Chapter 3, consumers demonstrate a strong willingness to return old/used products through takeback schemes, indicating significant potential for widespread adoption of this CE behaviour. However, they face challenges, particularly related to convenience, such as difficulties in transporting large items, limited drop-off points and a lack of collection services. Any policies or initiatives aimed at promoting takeback activities should address these barriers by making the product return process as convenient and accessible as possible.

4.2.3 Providing repair/maintenance services

- Cost issues are primary perceived barriers to both SMEs providing repair/maintenance services, as shown in Chapter 2, and consumers opting for professional repair services, as shown in Chapter 3. For construction SMEs, the cost of parts and components is the main obstacle, while, for manufacturing SMEs, labour costs are the greatest challenge. For consumers, the key perceived barriers are the cost of repair services and the low price difference between repairing items and purchasing new goods. To boost repair activity, policymakers should prioritise measures that lower repair costs for SMEs, such as VAT cuts on parts and components and tax incentives for hiring repair workers. Tax incentives could also be used to make repairing more financially appealing for consumers, such as VAT reductions on repair services. Consumers could also be offered tax deductions on the labour costs of repairs, similar to Sweden's model where 50% of repair labour costs for appliances and electronics are tax deductible up to about €2500 annually (or €5000 for those aged over 65 years) (Svensson-Hoglund *et al.*, 2021).
- A lack of knowledge on how to perform repairs is the main barrier for retail/wholesale SMEs, as highlighted in Chapter 2. To address this, policymakers should consider offering targeted training programmes on repair skills for these businesses. Providing online resources and technical support could also help them build the confidence and expertise needed to offer repair services effectively. These measures could be implemented via Skillnet Ireland, leveraging its expertise in industry-specific training initiatives, and in collaboration with stakeholders such as Retail Ireland. Additionally, original equipment manufacturers (OEMs) should be required to comply with the EU Right to Repair Directive, providing all information essential for repairing goods, including manuals, technical documentation and guidance on how to safely disassemble and reassemble products. This information has great potential to foster more repair activity, but it must be presented in a clear and accessible format. Policymakers should consider involving experts from OEMs or government agencies to develop repair guides based on the OEM-provided information, which could be used as part of SME training initiatives.
- In relation to self-repairs, resource and knowledge constraints, including limited access to parts, a lack of repair skills and uncertainty about repair feasibility, are the main perceived barriers to consumer engagement, as shown in Chapter 3. To address these issues, policymakers should consider scaling up repair cafés and workshops, like those offered by the Rediscovery Centre, where consumers can develop their repair skills alongside experts. Providing access to affordable parts, repair guides and online resources could further empower consumers to undertake repairs themselves. Technical guidance on performing repairs, provided under the EU Right to Repair Directive, could also help address consumers' knowledge gaps, particularly their challenges with disassembling products and the lack of repair manuals, which are also identified in Chapter 3 as perceived barriers to self-repair activity. While self-repair may divert some business away from SMEs, it is a crucial element of a functioning CE and could foster a repair culture that, in the long term, benefits SMEs by increasing overall repair activity.
- The risk of repaired products malfunctioning, possibly resulting in liability costs as well as additional repair costs, is a key perceived barrier for construction and retail/wholesale SMEs, as outlined in Chapter 2. Similarly, a lack of assurances regarding repair quality, including warranties, and concerns about future issues affect consumer decisions on professional repairs, as noted in Chapter 3. To address these challenges, policymakers should consider measures that improve protection for both SMEs and consumers. For SMEs, liability caps or an insurance scheme for repairs could help reduce their risks, especially in the light of the EU's new Product Liability Directive, which holds repairers outside OEMs liable for defects caused by product modifications. For consumers, a minimum guarantee period on repaired products could boost their confidence in repair services.

4.2.4 Selling remanufactured/refurbished goods

- The costs of parts and components poses a significant obstacle to the sale of remanufactured/refurbished goods for both construction and manufacturing SMEs, as shown in Chapter 2. Reducing these costs through measures such as VAT cuts should be a priority for policymakers.
- The risk of goods malfunctioning is a key barrier to selling remanufactured/refurbished goods for construction SMEs, probably due to the high costs and consequences associated with product failure in this sector, as discussed in Chapter 2. To mitigate this risk, policymakers could introduce protection for SMEs, such as liability caps for damage associated with remanufactured/refurbished goods or access to an insurance scheme to cover potential losses. Establishing a certification system or quality standards for these goods could also help to increase SMEs' confidence in selling these goods.
- A lack of customer demand is a significant barrier to selling remanufactured/refurbished goods for all SMEs, as highlighted in Chapter 2. This low demand is further evidenced in Chapter 3, which identifies key obstacles to buying remanufactured/refurbished goods, including product reliability and quality concerns, as well as low price differences relative to LE products. To address these issues, policymakers should consider measures to enhance consumer confidence in these goods, such as a certification system and stronger warranties or guarantees. Reducing VAT on sales of these goods could also help make them more financially appealing to consumers.
- For manufacturing SMEs, regulatory compliance, product safety and industry standards present significant challenges to selling remanufactured/refurbished goods, as discussed in Chapter 2. Potential measures to alleviate these issues include simplifying regulations on remanufactured/refurbished products and components, establishing clear quality standards and providing guidance and support to SMEs on legal matters.

4.2.5 Selling second-hand goods

- Similar to remanufactured/refurbished goods, weak customer demand is a key perceived barrier to selling second-hand goods for both construction and retail/wholesale SMEs, as highlighted in Chapter 2. This is largely due to the same issues that inhibit sales of remanufactured/refurbished goods, such as concerns about product reliability and quality and minimal price differences relative to LE products, as shown in Chapter 3. To boost demand, policymakers could use the same measures as recommended for remanufactured/refurbished goods, including a certification system, improved warranties and VAT reductions.
- Acquiring and supplying second-hand goods for resale is a key perceived challenge for construction and manufacturing SMEs, with a lack of access a major issue for construction SMEs and a lack of business partners to assist with selling second-hand goods a key perceived obstacle for manufacturing SMEs, as outlined in Chapter 2. To address these challenges, policymakers should consider fostering networks and platforms that connect SMEs with providers of second-hand goods. Supporting intermediaries to manage takeback schemes and creating synergies between them and potential buyers could also help establish a more efficient second-hand market.
- The risk of second-hand goods malfunctioning is a significant perceived barrier for retail/wholesale and manufacturing SMEs, as noted in Chapter 2. Measures such as liability caps, insurance schemes and certification systems, as previously discussed for remanufactured/refurbished goods, could also be used to alleviate these risks.

4.2.6 Leasing/renting goods (instead of selling goods)

- Of the various CBMs studied, leasing/renting goods is the least suited to widespread SME adoption, with many manufacturing and retail/wholesale SMEs deeming goods unsuitable for leasing/renting, as discussed in Chapter 2. Policy efforts are therefore more likely to succeed if targeted at product types more suited to this

business model, such as power tools, home electronic appliances/devices and formal clothing/footwear, as highlighted in Chapter 3.

- Financial barriers, particularly the high upfront investment costs of acquiring goods for leasing/renting, are the most significant perceived obstacles to SME adoption of this CBM. Policymakers could help offset these costs by offering financial incentives, such as grants, low-cost loans or tax breaks. Additionally, facilitating the transfer of idle or surplus goods from businesses with excess inventory to those seeking to lease/rent, for example through an online platform that matches providers with potential users, could help to reduce costs, shorten the payback period and improve resource efficiency in the economy.
- Financial risks arising from customers breaking contracts is a significant perceived barrier for both construction and manufacturing SMEs, as discussed in Chapter 2. To mitigate these risks, policymakers could provide protection such as insurance schemes for potential losses or clearer legal frameworks for contract enforcement.
- Retail/wholesale SMEs are primarily concerned with regulatory challenges and product standards that hinder the ability to lease/rent goods, as discussed in Chapter 2. Offering advisory services to help SMEs comply with legal requirements could help address this issue.

5 Conclusion

Transitioning from the LE to the CE is vital for addressing the urgent environmental challenges of climate change, pollution and biodiversity loss. Although Ireland has committed to this shift, its progress lags behind that of other countries. SMEs, which account for the vast majority of Irish businesses, are central to the transition, but their engagement in the CE remains low, largely due to barriers stemming from our deep ties to the LE. Consumers also have a key role to play in the transition, shaping the demand for CE products and services, yet their participation is also currently limited, hindered by various obstacles. Despite these challenges, there are promising signs for Ireland's CE transition, with many SMEs interested in adopting CBMs and evidence of untapped consumer demand for CE offerings, indicating potential for CE advancement.

However, due to the complexity of the transition and the scale of transformation needed, achieving meaningful progress will require a comprehensive and multifaceted policy framework that addresses key perceived barriers to the transition. Priority must be placed on tackling systemic barriers, including market-, financial- and knowledge-related challenges, which currently pose the biggest obstacle to CE engagement for SMEs. Policies aimed at fostering innovation within the economy and enhancing collaboration among SMEs are also essential for creating a more supportive CE environment. Targeted interventions are also required to drive engagement in CBMs involving product takeback schemes, repair/maintenance services, second-hand goods, remanufactured/refurbished goods and leasing/renting models, addressing sector-specific challenges for SMEs as well as the perceived barriers facing consumers. Only by adopting such a wide-ranging policy approach will Ireland realise its potential for a successful CE transition.

This project has provided the most comprehensive research to date on both Irish SME and consumer engagement in the CE, providing deeper insights into the motivations, barriers and policies necessary to support the transition, focusing particularly on CBMs. By integrating the views of both SMEs and consumers, it provides a basis for a more cohesive policy framework, supporting the development of the Whole of Government Circular Economy Strategy. However, it is just the first substantial step in a broader exploration of CE engagement in Ireland. Further research is needed to identify the most effective measures for overcoming the specific barriers to SME engagement across sectors and CBMs. Research examining how these barriers evolve at different stages of SME adoption of CBMs could also contribute to more effective policymaking, particularly with respect to scaling up CBM engagement. In-depth case studies of CBM implementation across different types of SMEs and sectors could additionally provide a clearer understanding of how SMEs manage the process of CBM adoption, building on the findings of this project. Future investigations of consumer CE engagement are also needed to ensure widespread and lasting behavioural changes across society. The role of social enterprises and public–private partnerships in accelerating the CE transition should also be explored to identify areas where they can make the most significant contributions. While much remains to be explored, this project's findings lay a solid foundation for future advancements.

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Appendix 1 Data and Results from Chapter 2

Table A1.1. Summary statistics for characteristics of the SMEs and respondents in the SME survey

Characteristic	Unweighted sample (%)	Unweighted sample (*n*)	Weighted sample (%)
SME characteristic			
Sector			
Construction	27.0	122	47.7
Manufacturing	39.4	178	12.3
Retail/wholesale	33.6	152	40.1
Size			
Micro-sized enterprise	38.7	175	92.1
Small-sized enterprise	31.0	140	6.7
Medium-sized enterprise	30.3	137	1.2
Region			
Border	10.4	47	9.6
Dublin	35.4	160	23.7
Mid-East	10.0	45	14.7
Midlands	4.4	20	6.1
Mid-West	12.6	57	10.2
South-East	5.3	24	9.4
South-West	10.6	48	15.6
West	11.3	51	10.8
Year established			
Before 2009	32.7	148	18.7
2009–2013	15.5	70	12.6
2014–2018	22.4	101	24.0
2019–2023	29.4	133	44.8
B2B sales			
No – 0% of revenue	6.4	29	9.6
Yes – 1–49% of revenue	71.4	323	72.1
Yes – 50–99% of revenue	20.6	93	17.7
Yes – 100% of revenue	1.6	7	0.7
Export sales			
No – 0% of revenue	49.3	223	55.2
Yes – 1–49% of revenue	31.9	144	35.2
Yes – 50–99% of revenue	13.7	62	5.1
Yes – 100% of revenue	5.1	23	4.5
Respondent characteristic			
Role in SME			
Owner	21.2	96	28.2
Part-owner	6.6	30	9.6
Managing director/chief executive officer	13.5	61	13.1
Director/chief officer	14.6	66	13.8

Table A1.1. Continued

Characteristic	Unweighted sample (%)	Unweighted sample (*n*)	Weighted sample (%)
General manager	13.3	60	14.8
Senior manager/executive	16.6	75	12.1
Manager/executive	7.5	34	3.5
Other type of managerial role	6.6	30	4.9
Age (years)			
18–34	33.4	151	32.4
35–54	62.8	284	62.8
55 or older	3.8	17	4.7
Gender			
Female	19.0	86	19.0
Male	81.0	366	81.0

Total base (unweighted *n*) = 452.

Table A1.2. Percentage of SMEs considering engaging in different numbers of CBMs, based on current engagement levels

		Number of CBMs that SMEs are considering engaging in							
		0	1	2	3	4	5	6	Total
Number of CBMs that SMEs are engaged in	0	20.1%	3.0%	0.9%	2.5%	1.6%	0.2%	0.2%	28.5%
	1	16.9%	2.2%	1.0%	1.9%	3.8%	4.4%	–	30.1%
	2	0.6%	1.3%	3.7%	3.3%	4.7%	–	–	13.6%
	3	1.0%	1.1%	1.4%	7.2%	–	–	–	10.7%
	4	1.0%	1.0%	9.9%	–	–	–	–	12.0%
	5	0.1%	1.4%	–	–	–	–	–	1.5%
	6	3.6%	–	–	–	–	–	–	3.6%

Total base (unweighted *n*) = 452.

Table A1.3. Percentage of SMEs planning to implement different numbers of CE activities, based on current engagement levels

		Number of CE activities that SMEs are planning to implement						
		0	1	2	3	4	5	Total
Number of CE activities that SMEs have implemented/under way	0	4.2%	0.9%	1.7%	1.0%	1.3%	1.9%	10.9%
	1	3.6%	1.0%	1.3%	2.4%	0.6%	–	8.8%
	2	3.6%	3.9%	1.2%	5.2%	–	–	13.9%
	3	1.2%	2.9%	13.3%	–	–	–	17.4%
	4	0.7%	23.8%	–	–	–	–	24.5%
	5	24.7%	–	–	–	–	–	24.7%

Total base (unweighted *n*) = 452.

Table A1.4. Percentage of SMEs reporting different responses regarding engagement in various CE activities: a comparison of the European Commission's Flash Eurobarometer 441 survey (2016) and our SME survey (2024)

Response	Survey	Re-designing products and services (%)	Minimising waste (%)	Using renewable energy (%)	Re-planning energy usage (%)	Re-planning of the way water is used (%)
Yes, activities have been implemented	2016	33.9	70.8	14.2	42.1	33.5
	2024	29.5	30.7	28.8	30.0	30.1
Yes, activities are under way	2016	8.2	3.4	3.3	11.1	7.5
	2024	31.3	37.3	37.5	29.5	25.2
No, but we plan to do so	2016	11.9	4.9	17.4	11.9	9.2
	2024	21.3	22.4	17.7	25.1	23.3
No, and we do not plan to do so	2016	35.1	18.9	59.3	31.8	38.2
	2024	11.1	5.8	10.3	12.5	15.5
Not applicable/don't know	2016	10.9	2.2	5.4	3.1	11.6
	2024	6.8	3.8	5.8	3.0	5.9

The CE activities are abbreviated for brevity; see Figure 2.3 for the full terms. The European Commission's Flash Eurobarometer 441 survey and our SME survey are referred to as 2016 and 2024, respectively. Total base (unweighted *n*) for our SME survey = 452. Total base (unweighted *n*) from the European Commission's Flash Eurobarometer 441 survey = 222.

Table A1.5. Percentage of SMEs reporting engagement in various CE activities in the European Commission's Flash Eurobarometer 441 survey (2016), by SME characteristic

Characteristic	Re-designing products and services (%)	Minimising waste (%)	Using renewable energy (%)	Re-planning energy usage (%)	Re-planning of the way water is used (%)
Sector					
Construction	41.2	67.7	14.7	47.9	48.4
Manufacturing	61.7	74.2	11.2	57.7	36.3
Retail/wholesale	37.3	81.6	22.7	58.3	34.1
Size					
Micro-sized enterprise	41.8	72.2	17.8	52.9	40.1
Small-sized enterprise	47.0	98.2	14.3	52.6	50.9
Medium-sized enterprise	37.1	86.5	18.4	84.1	50.3

Engagement refers to activities that were either implemented or under way. For brevity, the CE activities are abbreviated; see Figure 2.3 for the full terms. Total base (unweighted *n*) = 222.

Table A1.6. Percentage of SMEs reporting engagement in various CE activities in our SME survey (2024), by SME characteristic

Characteristic	Re-designing products and services (%)	Minimising waste (%)	Using renewable energy (%)	Re-planning energy usage (%)	Re-planning of the way water is used (%)
Sector					
Construction	70.2	70.1	77.6	75.4	54.0
Manufacturing	56.5	51.9	62.3	53.3	60.7
Retail/wholesale	53.4	71.3	57.2	46.7	54.7
Size					
Micro-sized enterprise	61.3	68.8	67.0	59.5	55.0
Small-sized enterprise	53.4	58.3	57.9	55.8	55.7
Medium-sized enterprise	64.6	76.7	70.1	75.1	74.0

Engagement refers to activities that were either implemented or under way. For brevity, the CE activities are abbreviated; see Figure 2.3 for the full terms. Total base (unweighted *n*) = 452. See Table A1.1 for details on subsample sizes (unweighted) by SME characteristic.

Table A1.7. Top three motivating factors for SME engagement in the CE, by SME characteristic

Characteristic	Number 1 factor	Number 2 factor	Number 3 factor
Sector			
Construction	Cost savings	Increased innovation in the economy	Supplier willingness
Manufacturing	Supplier willingness	Increased innovation in the economy	Cost savings
Retail/wholesale	Revenue generation	Cost savings	Increased innovation in the economy
Size			
Micro-sized enterprise	Cost savings	Revenue generation	Increased innovation in the economy
Small-sized enterprise	Customer preferences	Increased innovation in the economy	Availability of business partners
Medium-sized enterprise	Stricter laws/regulations/ standards	Supplier willingness	Cost savings
Region			
Dublin	Cost savings	Increased innovation in the economy	Revenue generation
Other region	Cost savings	Revenue generation	Increased innovation in the economy
Year established			
Before 2014	Cost savings	Revenue generation	Increased innovation in the economy
2014 or later	Cost savings	Revenue generation	Supplier willingness
B2B sales			
Less than 50% of revenue	Cost savings	Revenue generation	Increased innovation in the economy
50% or more of revenue	Cost savings	Increased innovation in the economy	Supplier willingness
Export sales			
No	Cost savings	Increased innovation in the economy	Supplier willingness
Yes	Revenue generation	Cost savings	Increased innovation in the economy

The motivating factors are abbreviated for brevity; see Figure 2.5 for the full terms. Total base (unweighted *n*) = 452. See Table A1.1 for details on subsample sizes (unweighted) by SME characteristic.

Table A1.8. Top three perceived barriers to SME engagement in the CE, by SME characteristic

Characteristic	Number 1 barrier	Number 2 barrier	Number 3 barrier
Sector			
Construction	Uncertainty about the financial benefits	ROI is low	Product standards are not conducive
Manufacturing	Uncertainty about the financial benefits	Lack of access to external finance	Costly to engage in R&D
Retail/wholesale	Lack of customer demand	Lack of access to external finance	Company lacks knowledge about the CE
Size			
Micro-sized enterprise	Uncertainty about the financial benefits	Company lacks knowledge about the CE	ROI is low
Small-sized enterprise	Product standards are not conducive	Company does not plan for the long term	Lack of customer demand
Medium-sized enterprise	Company tends to be risk averse	Company prioritises profit	Lack of business partners to assist
Region			
Dublin	Company prioritises profit	Company considers sustainability to be a cost	Product standards are not conducive
Other region	Uncertainty about the financial benefits	Company lacks knowledge about the CE	Lack of customer demand
Year established			
Before 2014	Uncertainty about the financial benefits	Company lacks knowledge about the CE	Customer perceptions of CE products
2014 or later	Uncertainty about the financial benefits	ROI is low	Product standards are not conducive
B2B sales			
Less than 50% of revenue	Uncertainty about the financial benefits	Lack of customer demand	Company lacks knowledge about the CE
50% or more of revenue	Uncertainty about the financial benefits	ROI is low	Lack of supplier support
Export sales			
No	Uncertainty about the financial benefits	Lack of customer demand	Lack of access to external finance
Yes	Uncertainty about the financial benefits	Lack of customer demand	Customer perceptions of CE products

The barriers are abbreviated for brevity; see Figure 2.6 for the full terms. Total base (unweighted *n*) = 452. See Table A1.1 for details on subsample sizes (unweighted) by SME characteristic.

Table A1.9. Top three policies/interventions for increasing SME engagement in the CE, by SME characteristic

Characteristic	Number 1 policy/intervention	Number 2 policy/intervention	Number 3 policy/intervention
Sector			
Construction	Increased provision of CE training	Access to a database of companies	Regulatory changes (waste/ recycled materials)
Manufacturing	Access to a database of companies	Regulatory changes (right to repair)	Public procurement contracts
Retail/wholesale	Reduced labour taxes	Increased financial supports	Public procurement contracts
Size			
Micro-sized enterprise	Increased provision of CE training	Reduced labour taxes	Access to a database of companies
Small-sized enterprise	Improvements in product design	Increased financial supports	Product labels
Medium-sized enterprise	Increased provision of CE training	Increased financial supports	Reduced VAT on CE goods/ services
Region			
Dublin	Increased provision of CE training	Reduced labour taxes	Standardised product design
Other region	Increased financial supports	Public procurement contracts	Increased provision of CE training
Year established			
Before 2014	Introduction of digital product passports	Improvements in product design	Reduced labour taxes
2014 or later	Increased provision of CE training	Regulatory changes (waste/ recycled materials)	Reduced labour taxes
B2B sales			
Less than 50% of revenue	Reduced labour taxes	Increased provision of CE training	Increased financial supports
50% or more of revenue	Improvements in product design	Public procurement contracts	Increased provision of CE training
Export sales			
No	Reduced labour taxes	Regulatory changes (waste/ recycled materials)	Increased provision of CE training
Yes	Improvements in product design	Introduction of digital product passports	Increased provision of CE training

The policies/interventions are abbreviated for brevity; see Figure 2.7 for the full terms. Total base (unweighted *n*) = 452. See Table A1.1 for details on subsample sizes (unweighted) by SME characteristic.

Appendix 2 Data and Results from Chapter 3

Table A2.1. Summary statistics for characteristics of the respondents in the consumer survey

Characteristic	%	*n*
Age (years)		
18–34	26.6	275
35–54	40.1	415
55 or older	33.3	345
Gender		
Female	54.4	563
Male	45.6	472
Region		
Border	6.8	70
Dublin	30.4	315
Mid-East	13.9	144
Midlands	6.1	63
Mid-West	8.9	92
South-East	9.2	95
South-West	15.3	158
West	9.5	98
Annual gross household income (€)		
< 32,075	26.5	274
32,075–55,034	26.0	269
55,035–85,507	25.4	263
> 85,507	22.1	229
Educational attainment		
No formal education	0.1	1
Primary-level education	1.5	15
Secondary-level education	36.0	373
Third-level education or higher	62.4	646
Urban/rural area type		
Rural area (population < 1500)	27.4	284
Small-sized town (population 1500–5000)	15.8	163
Mid-sized town (population 5000–50,000)	25.7	266
City (population > 50,000)	31.1	322

Total base (*n*) = 1035.

Table A2.2. Comparison of the consumer survey sample and the 2022 Census

Characteristic	% of consumer survey sample	% of 2022 Census
Age (years)		
18–34	26.6	27.1
35–54	40.1	38.4
55 or older	33.3	34.5
Gender		
Female	54.4	51.1
Male	45.6	48.9
Region		
Border	6.7	8.0
Dublin	30.4	29.0
Mid-East	13.9	14.4
Midlands	6.1	6.0
Mid-West	8.9	9.8
South-East	9.2	8.9
South-West	15.3	14.5
West	9.5	9.5

Total base (*n*) for the consumer survey = 1035. See Table A2.1 for details on subsample sizes.

Table A2.3. Product types purchased by consumers in the last 12 months

Product type	Description of products	% (*n*) who purchased the product type in the last 12 months
Building products	Windows, doors, flooring (wood/laminate), tiles (porcelain/ceramic), bath, shower tray, etc.	44.5 (461)
Formal clothing/footwear	Formal suit, dress, shirt, jacket, shoes, etc.	72.3 (748)
Informal clothing/footwear	Casual jacket, trousers, long-/short-sleeved top, shoes, etc.	95.6 (989)
Children's clothing/footwear	Casual jacket, trousers, long-/short-sleeved top, shoes, etc.	50.1 (519)
Home furniture	Sofa, chair, table, bed, wardrobe, etc.	53.0 (549)
Home furnishings	Curtains, blinds, cushions, carpet, rugs/mats, etc.	72.2 (747)
Small/handheld kitchen appliances	Air fryer, microwave, toaster, kettle, blender, etc.	76.6 (793)
Large kitchen appliances	Washing machine, tumble dryer, dishwasher, refrigerator, oven, etc.	31.8 (329)
Handheld/wearable personal electronic devices	Mobile phone, laptop, tablet, headphones, electronic watch, etc.	63.1 (653)
Home electronic appliances/devices (excluding kitchen appliances)	TV, home cinema/sound system, radio/stereo, printer, vacuum cleaner, etc.	44.9 (465)
Small/handheld power tools	Drill, sander, angle grinder, hedge trimmer, robotic lawnmower, etc.	35.2 (364)
Large power tools	Ride-on/push lawnmower, power/pressure washer, table saw, etc.	20.4 (211)

Total base (*n*) = 1035. Corresponding numbers of respondents shown in parentheses.

Table A2.4. Top five most frequently purchased product types by consumers in the last 12 months

Product type	% (*n*) who selected the product type among their top five most frequently purchased product types in the last 12 months
Building products	22.2 (230)
Formal clothing/footwear	57.4 (594)
Informal clothing/footwear	91.5 (947)
Children's clothing/footwear	43.1 (446)
Home furniture	30.9 (320)
Home furnishings	57.3 (593)
Small/handheld kitchen appliances	59.5 (616)
Large kitchen appliances	13.4 (139)
Handheld/wearable personal electronic devices	42.6 (441)
Home electronic appliances/devices (excluding kitchen appliances)	22.3 (231)
Small/handheld power tools	18.4 (190)
Large power tools	5.6 (58)

Total base (*n*) = 1035. Corresponding numbers of respondents shown in parentheses.

Table A2.5. Percentage of consumer purchases from SMEs, by product type

Product type	None (0%) (%)	Some (1–99%) (%)	All (100%) (%)	Total (%)
Building products	7.8	70.4	21.7	100.0
Formal clothing/footwear	16.5	75.9	7.6	100.0
Informal clothing/footwear	20.2	72.4	7.4	100.0
Children's clothing/footwear	23.1	70.6	6.3	100.0
Home furniture	16.9	69.7	13.4	100.0
Home furnishings	18.6	72.0	9.4	100.0
Small/handheld kitchen appliances	21.4	66.2	12.3	100.0
Large kitchen appliances	20.9	55.4	23.7	100.0
Handheld/wearable personal electronic devices	34.0	57.2	8.8	100.0
Home electronic appliances/devices (excluding kitchen appliances)	26.0	62.3	11.7	100.0
Small/handheld power tools	21.6	65.8	12.6	100.0
Large power tools	13.8	60.4	25.9	100.0

Percentages are based on respondents who selected the product type among their top five most frequently purchased in the last 12 months. See Table A2.4 for the corresponding numbers of respondents.

Table A2.6. Percentage of consumer purchases from local retailers, by product type

Product type	None (0%) (%)	Some (1–99%) (%)	All (100%) (%)	Total (%)
Building products	4.8	56.1	39.1	100.0
Formal clothing/footwear	9.3	74.4	16.3	100.0
Informal clothing/footwear	9.6	73.0	17.4	100.0
Children's clothing/footwear	9.6	73.8	16.6	100.0
Home furniture	9.7	65.3	25.0	100.0
Home furnishings	6.6	68.6	24.8	100.0
Small/handheld kitchen appliances	8.9	61.5	29.6	100.0
Large kitchen appliances	8.6	49.6	41.7	100.0
Handheld/wearable personal electronic devices	16.8	63.7	19.5	100.0
Home electronic appliances/devices (excluding kitchen appliances)	11.7	62.3	26.0	100.0
Small/handheld power tools	7.4	64.7	27.9	100.0
Large power tools	12.1	51.7	36.2	100.0

Percentages are based on respondents who selected the product type among their top five most frequently purchased in the last 12 months. See Table A2.4 for the corresponding numbers of respondents.

Table A2.7. Consumer engagement with various CBMs

CBM	% willing to engage	% who have previously engaged	Difference between % willing to engage and % who have previously engaged
Return old/used products to businesses via takeback schemes	97.4	56.2	41.2
Repair products (through either self-repair or professional repair services)	93.5	83.4	10.1
Purchase second-hand products	85.3	82.5	2.8
Purchase remanufactured/refurbished products	88.2	51.7	36.5
Lease/rent products (instead of buying products)	57.4	36.4	21.0

Total base (*n*) = 1035.

Table A2.8. Percentage of consumers willing to engage with various CBMs, by product type

Product type	Takeback (%)	Repairs (%)	Reman/refurb (%)	Second hand (%)	Lease/rent (%)
Building products	81.7	63.7	64.4	53.3	26.6
Formal clothing/footwear	73.0	69.4	60.8	59.9	58.6
Informal clothing/footwear	67.7	57.2	51.8	58.9	26.0
Children's clothing/footwear	72.7	54.1	52.3	54.3	27.7
Home furniture	79.3	80.5	82.6	76.7	38.1
Home furnishings	74.9	70.2	65.6	66.1	24.6
Small/handheld kitchen appliances	83.3	66.3	61.5	45.7	40.9
Large kitchen appliances	76.7	76.8	66.2	46.1	57.5
Handheld/wearable personal electronic devices	73.6	81.0	80.3	71.5	49.5
Home electronic appliances/devices (excluding kitchen appliances)	76.5	85.2	73.7	64.0	67.7
Small/handheld power tools	83.8	81.6	81.4	69.9	77.1
Large power tools	88.2	73.1	77.8	77.4	88.9

The CBMs are abbreviated for brevity; see Figure 3.3 for the full terms. Percentages are based on respondents who selected the product type among their top five most frequently purchased in the last 12 months. See Table A2.4 for the corresponding numbers of respondents.
Reman/refurb, remanufactured and refurbished.

Table A2.9. RII results for the perceived barriers to returning old/used products to businesses via takeback schemes

Barrier	RII score	RII ranking
Difficult to transport large/heavy products to a retailer	0.718	1
Lack of drop-off points for returning products	0.672	2
Businesses that operate takeback schemes do not offer collection services	0.624	3
Lack of awareness about takeback schemes	0.601	4
Need to pay money to return products	0.598	5
Lack of reward for returning products	0.509	6
Concerns about data privacy if returning electronic devices	0.472	7
Unsure what businesses will do with the products I take back	0.443	8
Prefer to keep products in case I want them in the future	0.414	9
Need to clean/wash clothes before returning them	0.327	10
Prefer to keep clothes for sentimental reasons	0.317	11

The RII ranges from 0 to 1. An RII score of 1 for a barrier would indicate that all respondents reported that it would inhibit their engagement with the CBM to a high extent. Conversely, an RII score of 0 for a barrier would indicate that all respondents reported that it would not inhibit their engagement with the CBM to any extent. Total base (*n*) = 1035.

Table A2.10. RII results for the perceived barriers to repairing products through self-repair

Barrier	RII score	RII ranking
Lack of access to parts needed to perform repairs	0.687	1
Lack of skills/know-how to perform repairs	0.673	2
Unsure if goods can be repaired easily	0.639	3
Difficult to disassemble products	0.632	4
Lack of tools to perform repairs	0.627	5
Lack of manuals/instructions on how to perform repairs	0.615	6
Concerns about fire/safety risks if repairing electrical appliances/devices	0.588	7
Likelihood of problems with repaired goods	0.532	8
Concerns about hygiene if repairing kitchen appliances	0.419	9
Prefer brand-new goods over repaired goods	0.396	10
Don't have the time to perform repairs	0.378	11

The RII ranges from 0 to 1. An RII score of 1 for a barrier would indicate that all respondents reported that it would inhibit their engagement with the CBM to a high extent. Conversely, an RII score of 0 for a barrier would indicate that all respondents reported that it would not inhibit their engagement with the CBM to any extent. Total base (*n*) = 1035.

Table A2.11. RII results for the perceived barriers to repairing products through professional repair services

Barrier	RII score	RII ranking
Costly to use repair services	0.721	1
Difficult to transport large/heavy goods to a repairer	0.719	2
Little price difference between repairing goods and buying new goods	0.713	3
Unsure if goods can be repaired easily/cheaply	0.695	4
Lack of availability of repair services	0.636	5
Lack of a warranty with repaired goods	0.604	6
Likelihood of problems with repaired goods	0.559	7
Concerns about fire/safety risks if repairing electrical appliances/devices	0.539	8
Time-consuming to organise a repair	0.537	9
Need to wait for goods to be repaired	0.533	10
Concerns about data privacy if repairing electronic devices	0.521	11
Uncertainty about repair quality	0.465	12
Prefer brand-new goods over repaired goods	0.449	13
Concerns about hygiene if repairing kitchen appliances	0.416	14

The RII ranges from 0 to 1. An RII score of 1 for a barrier would indicate that all respondents reported that it would inhibit their engagement with the CBM to a high extent. Conversely, an RII score of 0 for a barrier would indicate that all respondents reported that it would not inhibit their engagement with the CBM to any extent. Total base (*n*) = 1035.

Table A2.12. RII results for the perceived barriers to purchasing remanufactured/refurbished products

Barrier	RII score	RII ranking
Lack of a warranty with reman/refurb products	0.648	1
Likelihood of problems with reman/refurb products	0.626	2
Lack of availability of reman/refurb products	0.593	3
Little price difference between reman/refurb products and brand-new products	0.591	4
Uncertainty about quality of reman/refurb products	0.575	5
Concerns about fire/safety risks if buying reman/refurb electrical appliances/devices	0.559	6
Concerns about hygiene if buying reman/refurb kitchen appliances	0.537	7
Concerns about data privacy if purchasing reman/refurb electronic devices	0.528	8
Prefer brand-new products over reman/refurb products	0.527	9
Sellers of reman/refurb products do not offer delivery services	0.521	10
Time-consuming to source reman/refurb products	0.516	11

The RII ranges from 0 to 1. An RII score of 1 for a barrier would indicate that all respondents reported that it would inhibit their engagement with the CBM to a high extent. Conversely, an RII score of 0 for a barrier would indicate that all respondents reported that it would not inhibit their engagement with the CBM to any extent. Total base (*n*) = 1035. reman/refurb, remanufactured and refurbished.

Table A2.13. RII results for the perceived barriers to purchasing second-hand products

Barrier	RII score	RII ranking
Lack of a warranty with second-hand products	0.658	1
Likelihood of problems with second-hand products	0.625	2
Little price difference between second-hand products and brand-new products	0.623	3
Uncertainty about quality of second-hand products	0.610	4
Concerns about fire/safety risks if buying second-hand electrical appliances/devices	0.580	5
Lack of availability of second-hand products	0.554	6
Concerns about hygiene if buying second-hand kitchen appliances	0.554	7
Concerns about data privacy if purchasing second-hand electronic devices	0.533	8
Sellers of second-hand products do not offer delivery services	0.523	9
Prefer brand-new products over second-hand products	0.516	10
Time-consuming to source second-hand products	0.502	11

The RII ranges from 0 to 1. An RII score of 1 for a barrier would indicate that all respondents reported that it would inhibit their engagement with the CBM to a high extent. Conversely, an RII score of 0 for a barrier would indicate that all respondents reported that it would not inhibit their engagement with the CBM to any extent. Total base (*n*) = 1035.

Table A2.14. RII results for the perceived barriers to leasing/renting products (instead of buying products)

Barrier	RII score	RII ranking
Lack of availability of leasing/renting services	0.623	1
Little price difference between leasing/renting and purchasing brand-new products	0.588	2
Concerns about hygiene if leasing/renting kitchen appliances	0.571	3
Likelihood of problems with leased/rented products	0.571	4
Prefer brand-new products over leased/rented products	0.571	5
Lack of a warranty with leased/rented products	0.570	6
Time-consuming to source leased/rented products	0.566	7
Concerns about data privacy if leasing/renting electronic devices	0.553	8
Uncertainty about quality of leased/rented products	0.548	9
Providers of leased/rented products do not offer delivery services	0.541	10
Concerns about fire/safety risks if leasing/renting electrical appliances/devices	0.539	11

The RII ranges from 0 to 1. An RII score of 1 for a barrier would indicate that all respondents reported that it would inhibit their engagement with the CBM to a high extent. Conversely, an RII score of 0 for a barrier would indicate that all respondents reported that it would not inhibit their engagement with the CBM to any extent. Total base (*n*) = 1035.

Table A2.15. Consumer awareness and knowledge of the term "circular economy", by respondent characteristic

Characteristic	No – I have never heard of the term (%)	No – I have heard of the term but I do not know what it means (%)	Yes – I have some knowledge (%)	Yes – I have good knowledge (%)
Age (years)				
18–34	30.2	28.0	32.0	9.8
35–54	29.2	27.0	34.7	9.2
55 or older	31.3	23.2	39.4	6.1
Gender				
Female	34.8	25.2	33.0	6.9
Male	24.6	26.9	38.6	10.0
Region				
Dublin	28.9	25.4	35.2	10.5
Other region	30.7	26.3	35.7	7.4
Annual gross household income (€)				
< 32,075	37.2	25.6	31.8	5.5
32,075–55,034	31.2	29.0	34.2	5.6
55,035–85,507	30.4	23.2	38.4	8.0
> 85,507	20.1	26.2	38.4	15.3
Educational attainment				
Primary/secondary/no formal education	39.3	28.0	28.0	4.6
Third-level education or higher	24.6	24.8	40.1	10.5
Urban/rural area type				
Rural area (population < 1500)	29.6	28.2	38.7	3.5
Urban area (population ≥ 1500)	30.4	25.2	34.4	10.1

Total base (*n*) = 1035. See Table A2.1 for details on subsample sizes.

Table A2.16. Percentage of consumers willing to engage with CBMs across all product types they purchase, by respondent characteristic

Characteristic	Takeback (%)	Repairs (%)	Reman/refurb (%)	Second hand (%)	Lease/rent (%)
Age (years)					
18–34	54.2	43.6	44.4	35.3	26.6
35–54	61.7	41.0	39.5	34.7	15.4
55 or older	67.3	39.4	25.8	21.5	8.7
Gender					
Female	64.5	43.5	35.5	33.0	17.6
Male	58.1	38.4	37.1	27.3	14.4
Region					
Dublin	60.6	39.7	34.9	26.0	16.8
Other region	61.9	41.8	36.8	32.4	15.8
Annual gross household income (€)					
< 32,075	63.1	42.0	40.9	35.4	17.2
32,075–55,034	58.7	40.9	33.8	30.1	16.4
55,035–85,507	62.7	40.7	35.0	30.4	16.4
> 85,507	61.6	41.1	34.9	24.9	14.4
Educational attainment					
Primary/secondary/no formal education	60.2	37.0	38.3	29.8	14.7
Third-level education or higher	62.4	43.7	35.0	30.8	17.0
Urban/rural area type					
Rural area (population < 1500)	61.3	40.8	34.9	28.4	15.7
Urban area (population ≥ 1500)	62.3	42.3	39.8	35.9	17.3

The CBMs are abbreviated for brevity; see Figure 3.3 for the full terms. Total base (*n*) = 1035. See Table A2.1 for details on subsample sizes.
Reman/refurb, remanufactured and refurbished.

Abbreviations

B2B	Business-to-business
B2C	Business-to-consumer
CBM	Circular business model
CE	Circular economy
CMUR	Circular material use rate
CSO	Central Statistics Office
EPA	Environmental Protection Agency
LE	Linear economy
OEM	Original equipment manufacturer
R&D	Research and development
RII	Relative Importance Index
ROI	Return on investment
SMEs	Small and medium-sized enterprises
VAT	Value added tax
WEEE	Waste electrical and electronic equipment

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 truaillithe.

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 ardchaighdeáin, spriocdhírithe 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 peitril 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 Ghníomhú 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 taismí 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 chomhshaoil 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 Inbhunaitheacht 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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