

IMPLEMENTING CIRCULAR ECONOMY STRATEGIES IN THE FASHION INDUSTRY: A COMPARATIVE SUPPLY CHAIN ANALYSIS

A document-based content analysis of five fashion and sportswear brands

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Summary

This dissertation explores how circular economy (CE) strategies are reported and applied by five European fashion and sportswear brands. In response to growing sustainability pressures, many firms have adopted CE language in their communication, yet the extent of actual implementation remains unclear.

The central research question concerns variation in CE strategy types and implementation patterns across different stages of the supply chain. To investigate this, a comparative multi-case analysis was conducted based on annual and sustainability reports from five companies: H&M, Inditex, Mango, OVS, and Adidas. These companies were selected for their diverse business models and market positioning. A structured framework was applied to examine the location of CE strategies within the supply chain and their level of integration into company disclosures. The findings show that CE strategies are mainly concentrated in upstream and midstream operations, while downstream initiatives remain limited. Implementation depth varies, as some companies exhibit signs of operational change, while many commitments remain at the strategic level without concrete follow-through. The study highlights how sustainability reporting not only reflects but also shapes the CE discourse within companies, raising questions about the alignment between stated ambitions and actual transformation. By integrating CE maturity, supply chain positioning, and reporting as an interpretive lens, this research contributes to a deeper understanding of how circularity is framed and applied across the industry.

Resumo

Esta dissertação explora como as estratégias de economia circular (EC) são comunicadas e aplicadas por cinco marcas europeias de moda e artigos desportivos. Em resposta à crescente pressão por sustentabilidade, muitas empresas adotaram a linguagem da EC na sua comunicação corporativa, embora a extensão da implementação efetiva permaneça incerta.

A questão central de investigação diz respeito à variação nos tipos de estratégias de EC e nos padrões de implementação ao longo das diferentes etapas da cadeia de abastecimento. Para investigar esta questão, foi realizada uma análise comparativa de múltiplos casos com base nos relatórios anuais e de sustentabilidade de cinco empresas: H&M, Inditex, Mango, OVS e Adidas. Estas empresas foram selecionadas pela diversidade dos seus modelos de negócio e posicionamento no mercado. Foi aplicado um enquadramento estruturado para examinar a localização das estratégias de EC ao longo da cadeia de abastecimento e o seu grau de integração nas divulgações corporativas. Os resultados mostram que as estratégias de EC estão principalmente concentradas nas fases a montante e intermédias da cadeia, enquanto as iniciativas a jusante continuam limitadas. A profundidade da implementação varia: algumas empresas demonstram sinais de mudança operacional, enquanto muitos compromissos permanecem a um nível estratégico sem uma tradução concreta em ações. O estudo destaca como o relato de sustentabilidade não só reflete, mas também molda o discurso da EC dentro das empresas, levantando questões sobre a coerência entre as ambições declaradas e a transformação efetiva. Ao integrar maturidade em EC, posicionamento na cadeia de abastecimento e relato como lente interpretativa, esta investigação contribui para uma compreensão mais aprofundada de como a circularidade é enquadrada e aplicada no setor.

Foreword

This thesis, titled “Implementing circular economy strategies in the fashion industry: a comparative supply chain analysis”, represents the completion of my double degree program. One thing is certain: I will never look at clothing in the same way again.

It not only brings an intensive academic journey to a close but also opens the door to a new chapter. The past years have been enriching, challenging, and unforgettable, filled with valuable knowledge, new perspectives, and personal growth.

I want to thank everyone who has contributed to my academic journey. Your support, encouragement, and inspiration, in both big and small ways, have played a crucial role in shaping the path that led me here. In particular, I would like to sincerely thank my parents for their endless support, listening ear, and belief in me, even during moments of doubt. I am also grateful to my classmates, who have become true friends. You made the long study nights more bearable, the difficult days lighter, and the good moments even better.

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List of Abbreviations, Tables, and Figures

List of Abbreviations

CE: Circular Economy
C2C: Cradle-to-cradle
NGO: Non-governmental organisation
RQ: Research Question
R&D: Research and Development
SC: Supply Chain
ID: Implementation Dimension

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1 Introduction

1.1 Background and Context

The fashion industry plays a major role in shaping global consumer behaviour and economic growth. By 2025, it is expected to generate \$1.84 trillion and provide jobs for over 430 million people (UniformMarket, 2024). However, this impact comes with significant environmental and social costs. Despite its creative and cultural value, the sector is among the most polluting and resource-intensive worldwide (Hossain et al., 2024).

Fashion operates predominantly under a linear "take, make, dispose" model. This leads to overproduction, depletion of natural resources, and massive waste generation (Abdelmeguid et al., 2022; Gazzola et al., 2020). Each year, an estimated 80 – 100 billion garments are produced, but nearly 87% end up in landfills or are incinerated. This results in 92 million tonnes of textile waste per year (Abbate et al., 2023). Only around 20% of these textiles are collected for reuse or recycling (Marques et al., 2020; Pal & Gander, 2018).

The industry relies heavily on virgin inputs. Cotton represents 40% of the global clothing fibre market and requires substantial volumes of water (Ravasio, 2012). The production of a single T-shirt may require as much as 2,700 litres of water, according to Shirvanimoghaddam et al. (2020). Additionally, dyeing and finishing account for nearly 20% of global industrial water pollution (Abbate et al., 2023; Centobelli et al., 2022). Moreover, water use is projected to increase by 400% by 2050, placing additional pressure on already water-scarce regions (Aivazidou & Tsolakis, 2019). Synthetic fibres, such as polyester, account for approximately 60% of all textiles (Ellen MacArthur Foundation, 2017). They are fossil-fuel-based and contribute significantly to plastic pollution (European Environment Agency, 2021). Each year, the sector generates approximately 42 million tonnes of plastic waste, making it the second-largest contributor after packaging (UNEP, 2019). During washing, synthetic garments can release up to 700,000 microfibers per load (Napper & Thompson, 2016), equivalent to almost three billion polyester shirts (UNEP, 2019). These microfibres account for 9% of global microplastic pollution and often end up in aquatic ecosystems (UNEP, 2019), posing a threat to both wildlife and human health (GESAMP, 2021). The sector also has a substantial carbon footprint. It is responsible for 2 – 8% of total global greenhouse gas emissions, which is more than international aviation and shipping combined (UNEP, 2019).

In addition to environmental damage, the fashion industry's social footprint is equally concerning. The Rana Plaza tragedy in 2013 became a symbol of the fashion industry's neglect of worker safety, highlighting the risks faced by thousands of garment workers in low-cost production facilities (Clean

Clothes Campaign, 2024). However, problems such as low wages, long working hours, and exposure to chemicals remain common (Roos et al., 2016). These are rooted in global value chains, where brands control costs while production is outsourced to countries with weak labour laws (Centobelli et al., 2022). Fewer than 2% of garment workers earn a living wage (EarthDay.org, 2024). Women, who make up about 80% of the workforce, often face poor pay, informal contracts, unsafe conditions, and gender-based violence (Sumner, 2015; Global Labour Justice, 2018). These structural inequalities make clear that sustainability is not just about the environment; it also has to account for issues of social justice (Sasha et al., 2024).

In this context, the circular economy (CE) has emerged as a promising alternative. It promotes strategies such as reuse, repair, recycling, and regenerative design (Ellen MacArthur Foundation, 2023). In the fashion industry, this includes durable design, the use of recycled inputs, take-back schemes, and closed-loop systems (Williams, 2015; Saha et al., 2024), aligning with the UN Sustainable Development Goals (Zorpas, 2024). Still, there is an apparent tension. Dissanayake and Sinha (2015) argue that “fashion consumption and sustainability are contradictory in nature: fashion consumes many natural resources and generates waste, whereas sustainability strives for resource conservation and zero waste.” The gap between current practices and ecological priorities continues to put pressure on the environment. At the same time, the term “sustainability” is used in different ways, sometimes referring to efficiency, other times to fairness or social justice, which makes its application inconsistent (Sumner, 2015). Reaching the Sustainable Development Goals will require a fundamental shift in how we produce and consume. For fashion, this means aligning with the “triple bottom line” of environmental health, social equity, and economic viability (Chowdhury et al., 2022). Circular strategies can support this, but only if applied across the whole supply chain and backed by structural commitment (Islam, 2021).

1.2 Research Problem and Rationale

Although the circular economy (CE) is increasingly integrated into sustainability, the extent to which these principles are embedded in actual operations remains uneven (Todeschini et al., 2020). Many fashion companies highlight their CE strategies in their public reports, such as the use of recycled content, resale platforms, or take-back initiatives. However, many of these commitments are often vague, lack clear targets, or show little connection to core production processes (Wong & Ngai, 2021). This raises the question of whether CE principles are genuinely being implemented or primarily used to enhance public image (Garcia-Torres et al., 2017). Academic literature reflects this ambiguity. While several conceptual models and normative frameworks have been developed, empirical studies that assess CE

implementation across multiple brands and supply chain stages remain scarce (Kirchherr et al., 2017). More broadly, limited attention has been paid to the extent to which performance indicators, scaled integration, or investment in innovation support commitments to CE. These key factors are crucial in determining whether CE becomes structurally embedded or remains symbolic (Kirchherr et al., 2017; Todeschini et al., 2020).

This study is informed by the work of Dragomir and Dumitru (2022) and explores the implementation of circular economy (CE) strategies across five European fashion and sportswear companies. These firms were selected to represent a diversity of business models, including fast fashion, mass-market, and innovation-driven brands. Through a document-based content analysis of recent annual and sustainability reports, it maps not only which CE strategies are adopted and where in the supply chain they are implemented, but also how deeply they are integrated in day-to-day operations. By examining both the variety of strategies and their implementation, the research aims to provide insight into how circular economy thinking is evolving in the fashion industry, as reflected in company reports.

1.3 Research Focus and Questions

The central research question guiding this study is: What does the implementation of circular economy strategies across the supply chains of European fashion and sportswear companies reveal about differences in those strategies and implementation patterns?

To explore this question, the study focuses on two key dimensions. First, it aims to understand the strategic focus of circular economy efforts, specifically which circular economy (CE) strategies are adopted by each of the five selected companies and at which stages of the supply chain these strategies are positioned. It also considers the similarities and differences in strategic focus between fast fashion, mass market, and innovation-driven brands. Second, it explores the depth of implementation by examining how deeply circular strategies are embedded within each company's operational model and how integration levels differ across brand types. This approach supports both company-level and category-level exploration, highlighting recurring patterns, strategic tensions, and structural differences in how circularity is interpreted and applied across the sector.

1.4 Scope and Limitations

This study focuses on five European fashion and sportswear companies: H&M, Inditex (Zara), Mango, OVS, and Adidas. It relies exclusively on secondary data, specifically annual and sustainability reports published between 2023 and 2024. These documents were examined using qualitative content analysis, with no primary data collection such as interviews or surveys. Given its exclusive reliance on corporate reporting, the study aims to understand how CE commitments are presented by firms, without directly observing practical execution or stakeholder perception.

This approach comes with certain limitations. First, as the data are self-reported, there is a risk of bias in how strategies are framed and disclosed. Companies may vary in their level of transparency, detail, or critical reflection. Second, the study does not assess actual environmental or social performance outcomes. It does not consider factors such as life-cycle impact, consumer behaviour, or the technical effectiveness of recycling efforts, nor can it determine the actual environmental or social impact of the reported strategies. Finally, although most companies follow frameworks like the GRI or ESRS, differences in reporting scope and format remain, which may affect comparability across brands.

Nonetheless, document analysis provides valuable insights into strategic positioning, particularly in a context of increasing regulatory scrutiny and stakeholder expectations. As corporate sustainability reporting becomes more standardised and subject to external verification, these documents serve not only as communication tools but also as formal representations of organisational intent and accountability.

1.5 Dissertation Structure

This dissertation is structured into five chapters, each contributing to a comprehensive analysis of the implementation of circular economy principles across the supply chain in the fashion industry. Chapter 1 introduces the research context, defines the problem, and outlines the study's objectives and scope. Chapter 2 presents the literature review, examining the conceptual foundations of CE, implementation strategies across the apparel supply chain, relevant barriers and enablers, and gaps in existing research that inform the study's analytical focus. Chapter 3 describes the methodological approach, including case selection, the three-dimensional analytical framework, coding procedures, and the overall data analysis strategy. Chapter 4 outlines the study's empirical results structured around two key dimensions. The first concerns the strategic focus of CE initiatives, including the types of strategies reported and their positioning along the supply chain. The second addresses the depth of organisational implementation.

For each dimension, a cross-case comparison highlights differences across brand types. Finally, Chapter 5 concludes the dissertation by summarising the main findings, discussing theoretical and practical implications, and offering recommendations for future research. Supplementary materials are provided in the appendices.

2 Literature Review

2.1 Circular Economy: Definitions and Principles

The circular economy (CE) has become a central concept in sustainability, offering a regenerative alternative to the traditional “take, make, dispose” model (Franco, 2017). Rather than maximising throughput, CE aims to preserve resource value by designing out waste, extending lifecycles, and closing material loops (Geissdoerfer et al., 2017; Ellen MacArthur Foundation, 2023). It reframes economic activity as regenerative, both in intention and design (Koszewska, 2018).

Despite its conceptual appeal and growing prominence in policy and business, CE remains inconsistently defined and understood. Kirchherr et al. (2017), in their review of 114 definitions, found that most focus narrowly on technical strategies, such as reuse, recycling, and recovery, while overlooking social, institutional, and behavioural dimensions. This definitional vagueness creates space for superficial or selective applications, allowing companies to adopt circular language without disrupting linear business models (Jestratijevic et al., 2023). This phenomenon, often referred to as “circular washing,” is particularly evident in sectors such as fashion, where fast fashion brands may launch small capsule collections using recycled fibres while maintaining high-volume, short-lived production systems (Korhonen et al., 2017; Garcia-Torres et al., 2017). To guide more robust implementation, a range of conceptual and operational frameworks has emerged. A foundational contribution is the Ellen MacArthur Foundation’s (2024) model, which defines three core principles: (1) design out waste and pollution, (2) keep products and materials in use, and (3) regenerate natural systems. These principles are operationalised through two distinct material cycles. Biological materials should be safely returned to nature, for example, organic cotton or compostable fibres. In contrast, technical materials such as polyester or nylon should be reused or recycled in closed loops without degrading quality (Saha et al., 2024). In practice, however, businesses often lack the infrastructure, incentives, or capacity to effectively distinguish and support these material flows (Rani & Saha, 2021). Building on this foundation, additional frameworks such as the “9R” and “10R” hierarchies have extended the original “reduce, reuse, recycle” paradigm. These models prioritise upstream interventions, such as “refuse,” “rethink,” and “redesign,” that aim to prevent waste before it

occurs and encourage systemic transformation (Reike et al., 2018; Zorpas, 2024). Likewise, the cradle-to-cradle (C2C) approach proposes that products should be designed for either safe biodegradation or endless technical reuse (Franco, 2017). Bocken et al. (2016) further distinguish between three types of circular strategies: narrowing (increasing efficiency), slowing (extending product life), and closing (material recycling). These distinctions highlight that circularity is not only about maintaining material flow but also about doing so strategically, aligned with both ecological and economic priorities.

The theoretical scope of CE extends beyond material loops. It aligns closely with broader sustainability paradigms, such as the planetary boundaries framework (Steffen et al., 2015), which identifies ecological thresholds that must not be crossed to ensure the stability of the Earth system. Complementing this, the “doughnut economy” (Raworth, 2017) integrates social foundations into sustainability thinking, framing a safe and just operating space for humanity. Circular economy contributes to these models by aiming to decouple economic growth from resource extraction. It also promotes greater equity in access to and benefits from materials and value creation (Dearing et al., 2014). However, despite this rich conceptual development, measurement challenges further hinder implementation. Currently, there is no universal framework for assessing circularity, and companies rely on divergent metrics that complicate benchmarking (Saccani et al., 2022). Aiming to address this gap, the upcoming ISO 59000 series may help standardise definitions, indicators, and auditing procedures (Saha et al., 2024).

In sum, CE offers a comprehensive and promising response to the shortcomings of linear production systems. However, its transformative potential depends not on isolated projects or pilot programs, but on integrated strategies embedded across entire value chains (Keßler et al., 2021). In industries such as fashion, where environmental degradation and social exploitation intersect, such systemic integration is not only desirable but also essential for credible and lasting change (Saha et al., 2024; Wong & Ngai, 2021).

2.2 Circular Economy Strategies in the Apparel Supply Chain

Circular economy (CE) strategies in the fashion industry encompass the entire apparel value chain, spanning from design and sourcing to post-consumer recovery and recycling. While each stage presents distinct opportunities for circular interventions, the consistency and depth of implementation vary widely (Ki et al., 2020). Some strategies are obvious, such as resale platforms or take-back schemes, while others require upstream transformations that remain less apparent to consumers (Niinimäki et al., 2020; Kirchherr et al., 2017). Organising these practices by supply chain stage enables a more nuanced understanding of how circularity is interpreted and applied across the sector (Dragomir & Dumitru, 2022).

Design serves as a crucial starting point for circularity (Islam, 2021). Choices related to materials, construction techniques, and aesthetics significantly influence a product's entire lifecycle, including its durability, disassembly, and recyclability (Maduna & Patnaik, 2023). Innovation-driven brands often lead in developing solutions such as mono-materials, modular garments, and timeless styles. These efforts are sometimes supported by lifecycle-based design training (Ki et al., 2020; Rani & Saha, 2021). In contrast, fast fashion companies face structural barriers to integrating such practices. Nevertheless, some brands have begun experimenting with CE elements in limited or capsule collections (Franco, 2017; Choudhury, 2014).

Following product design, sourcing decisions further define the circular profile of a product. Here, circularity typically involves replacing virgin materials with regenerative or recycled inputs. Brands with long-term sustainability roadmaps may opt for bio-based fibres like PLA or hemp (Abbate et al., 2023). Others gradually increase their use of recycled cotton or align with programs such as the Better Cotton Initiative (Sumner, 2015). However, many companies that prioritise speed and scale, particularly in the value segment, continue to rely heavily on conventional cotton and virgin synthetic fibres (Nayak et al., 2019).

In the textile production stage, CE initiatives often aim to improve resource efficiency and minimise waste. Low-impact dyeing technologies, the use of biodegradable chemicals, and seamless or zero-waste manufacturing techniques are typical examples (John & Mishra, 2022; Nayak et al., 2019). Innovation-focused firms may explore these options through pilot projects and supply chain partnerships, while others selectively implement improvements via certified suppliers (Jacometti, 2019).

Manufacturing itself offers further opportunities to embed circularity through lean production, closed-loop water and chemical systems, or localised production models (Rehman, 2024). Such strategies are typically more accessible to vertically integrated or smaller-scale companies. By contrast, larger firms operating through complex, outsourced supply networks often rely on audit systems and supplier codes of conduct to enforce environmental performance. However, traceability remains an ongoing challenge (de Brito et al., 2008; Pervez et al., 2021).

Circular interventions also extend into packaging, logistics, and retail. Eco-designed packaging, efficient distribution methods, and alternative business models, such as resale, rental, or subscription, are gaining traction. A few brands have integrated these models at scale, while others are still testing them in pilot form due to logistical and infrastructural constraints (Abbate et al., 2023; Centobelli et al., 2022).

The role of users in extending product lifecycles is receiving growing attention. Strategies here include customer education, repair services, and garment care tools. Some brands actively promote long-term use through campaigns or services, while others provide general care labels or basic maintenance tips. In business models reliant on rapid consumption, such efforts remain limited (Niinimäki, 2020; Hawley, 2015; Sumner, 2015).

Post-consumer collection systems, including in-store take-back schemes, are becoming more prevalent (Ki et al., 2020). Certain companies link these programs to circular production efforts, while others primarily report collection volumes without disclosing subsequent processing outcomes (Jacometti, 2019). For many, economic and logistical barriers continue to hinder closed-loop ambitions (Koszevska, 2018).

Recycling remains one of the most complex areas for CE due to technical constraints. Mechanical recycling degrades fibre quality, while chemical methods require mono-material inputs and remain costly (Sandin & Peters, 2018). As a result, only a small fraction of textiles are recycled into new garments (Ellen MacArthur Foundation, 2017). Some firms collaborate with technology providers, while others participate in industry consortia or rely on donation models (Marques et al., 2020).

Traceability and transparency tools, including RFID, blockchain, and digital product passports, are gaining ground as enablers of circular systems. These technologies enhance material tracking, stakeholder reporting, and regulatory compliance (Saccani et al., 2022; Wong & Ngai, 2021; Colucci & Vecchi, 2020). Early adopters often strategically embed these tools, while others implement them more reactively, driven by external pressure or legislation (Saha et al., 2024).

Certification schemes also play a supporting role in CE governance. Labels such as GOTS and OEKO-TEX are widely used to verify material and process standards (Ikram, 2022; Pervez et al., 2021). At the same time, some companies integrate certification schemes into sourcing policies. Others use them more selectively, often as reputational tools, and vary in the degree of third-party verification (De Smet et al., 2015).

Lastly, collaboration is essential for scaling CE efforts beyond individual companies. Multi-stakeholder partnerships involving NGOs, recyclers, or cross-sector platforms help distribute risk, share knowledge, and accelerate innovation (Suarez-Visbal et al., 2024). However, some firms continue to rely on proprietary initiatives, which limit their broader systemic impact (Jacometti, 2019).

In summary, the implementation of circular economy practices in the fashion industry is highly uneven and often reflects brand strategy. Companies focused on innovation tend to pursue the circular economy (CE) more holistically, although usually on a smaller scale (Bocken et al., 2016). Mass-market brands strike a balance between incremental progress and operational feasibility (Bieńkowska, 2023). In contrast, fast fashion players primarily emphasise visible, consumer-facing strategies with limited upstream transformation (Garcia-Torres et al., 2017; Dragomir & Dumitru, 2022). Assessing circularity in this context requires not only an inventory of strategies but also a deeper examination of how they are integrated or isolated within the business model (Saha et al., 2024).

2.3 Barriers and Enablers to Circular Economy Implementation

While interest in circular economy (CE) strategies continues to grow in the fashion sector, their implementation is influenced by both barriers and enablers. These factors encompass economic, technological, organisational, and behavioural domains, and vary across company size, supply chain complexity, and regional contexts. Identifying both the obstacles and the enabling conditions is key to understanding the uneven uptake of CE and assessing the realism of circularity goals (Franco, 2017; Kirchherr et al., 2017; Ghisellini et al., 2015; Garcia-Torres et al., 2017; DiVito & Bohnsack, 2017).

A primary barrier is economic. Circular models often require a high up-front investment in innovation, infrastructure, and reverse logistics. Especially for SMEs, the cost-benefit ratio remains uncertain, and CE efforts may compete with short-term cost control imperatives (DiVito & Bohnsack, 2017; Niu et al., 2017; Bocken et al., 2016). Business models like rental or resale introduce operational complexity and capital intensity, which many firms are not equipped to manage (de Brito et al., 2008; Todeschini et al., 2017). Technological limitations present another major hurdle. Textile recycling technologies, particularly for blended fibres, are still in the development stage (Hawley, 2015; Franco, 2017). Chemical and enzymatic methods remain expensive, energy-intensive, and limited to mono-material inputs (Parisi et al., 2015; Sandin & Peters, 2018). Additionally, weak supply chain data and fragmented IT systems hinder traceability and material recovery (Sumner, 2015; Saha et al., 2024). Without standardised tools or benchmarks, it is challenging for companies to evaluate CE performance (Winter & Lasch, 2016; Garcia-Torres et al., 2017). Organisational structures also limit CE progress. Many fashion companies operate in silos, where sustainability teams are disconnected from core departments, such as design, procurement, and logistics (Korhonen et al., 2017; Garcia-Torres et al., 2017). Speed-to-market pressures and short product development cycles leave little space for experimentation or long-term redesign. In such settings, CE often remains a communication tool rather than an integrated business function (Fischer & Pascucci, 2016; De Smet et al., 2015). Consumer behaviour adds further complexity. While sustainability awareness has grown, purchase decisions are still dominated by price and convenience (Niinimäki, 2020; Yang et al., 2017). Circular models, such as take-back schemes or rental, require a level of consumer effort that remains rare in practice (Lewis, 2015; Koszewska, 2018). Inconsistent messaging and greenwashing further reduce consumer trust and understanding (Garcia-Torres et al., 2017). Cultural stigmas around second-hand clothing and unfamiliarity with circular services also limit behaviour change (Todeschini et al., 2017; Sumner, 2015).

Despite these challenges, several enabling factors are emerging. Regulatory pressure is rising through instruments such as the EU Circular Economy Action Plan, France's AGEC Law, and the forthcoming Eco-design for Sustainable Products Regulation. These frameworks promote extended producer responsibility, product traceability, and lifecycle impact disclosures, shifting CE from a voluntary to a mandatory framework (Sumner, 2015; Saha et al., 2024). Technological advancements are also supporting the transition. Blockchain, RFID, and digital product passports enhance supply chain visibility, enabling closed-loop logistics (Saccani et al., 2022; Colucci & Vecchi, 2020; Wong & Ngai, 2021). Emerging recycling technologies and sorting systems promise to improve fibre recovery at scale (Hawley, 2015). Investing in digital infrastructure enables brands to track CE progress and integrate circularity into their performance metrics (Saha et al., 2024; Parisi et al., 2015). Organisational change plays a key role. Leadership commitment, cross-functional collaboration, and the integration of CE into KPIs and reporting structures enhance internal alignment (DiVito & Bohnsack, 2017; Winter & Lasch, 2016). Brands that link sustainability with innovation, rather than compliance, are better positioned to scale circular initiatives (Todeschini et al., 2017; Fischer & Pascucci, 2016). Finally, cultural and market shifts offer fertile ground. Younger consumer segments increasingly value transparency, reuse, and ethical sourcing (Yang et al., 2017; Sumner, 2015). The growth of resale and rental platforms, coupled with increased scrutiny of fast fashion practices, is reshaping expectations. Brands that move beyond symbolic actions and embed CE into their everyday operations may capture both reputational and strategic advantages (Garcia-Torres et al., 2017).

In summary, the implementation of CE in the fashion industry is shaped by a dynamic interplay of barriers and enablers. While economic and technological constraints persist (Franco, 2017), shifting regulations, innovations, and changing consumer values provide new opportunities (Yang et al., 2017). The future of circular fashion will depend on whether firms can move from experimentation to systemic change, linking vision with execution across the entire value chain (DiVito & Bohnsack, 2017).

Table 1 provides a summary of the main barriers and enablers discussed above, categorised by domain and supported by relevant literature.

2.4 Gaps in Literature and Contribution of This Study

Despite growing academic interest in the circular economy (CE) in the fashion industry, key analytical gaps remain. First, many studies offer conceptual frameworks or isolated case studies but fail to provide comparative insights into how CE is operationalised across brand types and value chain stages (Kirchherr et al., 2017; Dragomir & Dumitru, 2022). Second, although sustainability reporting has become a key focus

Category	Barriers	Enables	Key Referenes
Economic	High upfront investment, uncertain ROI, lack of scalability for SMEs	Business model innovation, service-based models (e.g., rental, resale), regulatory incentives	DiVito & Bohnsack (2017); Niu et al. (2017); Todeschini et al. (2017)
Technological	Immature recycling technologies, high cost of chemical processes, lack of traceability systems	Advancements in blockchain, RFID, digital product passports, new fibre sorting systems	Franco (2017); Parisi et al. (2015); Saccani et al. (2022); Wong & Ngai (2021)
Organizational	Siloed departments, short development cycles, lack of CE integration into core functions	Cross-functional collaboration, CE-linked KPIs, leadership commitment	Garcia-Torres et al. (2017); Fischer & Pascucci (2016); Winter & Lasch (2016)
Behavioral	Consumer focus on price/convenience, low participation in CE models, greenwashing	Rising awareness among Gen Z, cultural shifts, appeal of resale & rental platforms	Niinimäki (2020); Yang et al. (2017); Lewis (2015); Garcia-Torres et al. (2017)
Regulatory/ Policy	Voluntary frameworks lack enforcement	EU CE Action Plan, Ecodesign Regulation, EPR policies transitioning from soft to hard law	Sumner (2015); Saha et al. (2024)

Table 1. Barriers and Enablers for the Circular Economy in Fashion

of CE research, few studies critically examine how companies use reporting to frame their circular efforts, nor do they evaluate the coherence, strategic integration, or depth of the reported initiatives (Korhonen et al., 2017; Garcia-Torres et al., 2017). These risks include overstating progress and underestimating symbolic adoption and organisational constraints. Third, there is limited empirical analysis of how different business models, such as fast fashion, mass market, and innovation-driven brands, shape the adoption, distribution, and depth of CE strategies across supply chains (Saha et al., 2024).

This dissertation addresses these gaps through a comparative supply chain analysis of CE implementation across five European fashion and sportswear brands. Drawing on qualitative content analysis of annual and sustainability reports, it examines: (1) the types of CE strategies adopted, (2) their location across supply chain stages, and (3) their depth of implementation. By comparing brand types, the study reveals how CE is variably interpreted and implemented, and whether observed efforts reflect structural change or symbolic alignment. In doing so, this research makes both theoretical and practical contributions. It offers a structured framework for analysing CE maturity, identifying patterns across brand typologies, and exploring the relationship between ambition and operational reality.

2.5 Implications for Research Design

The research design is directly shaped by the gaps identified in the literature. First, the lack of comparative, multi-brand studies calls for an approach that examines variation across business models. By including fast fashion, mass-market, and innovation-driven brands, the study aims to explore how CE strategies vary in terms of type, supply chain positioning, and depth of implementation across different organisational contexts. Second, the frequent disconnection between corporate CE discourse and actual supply chain practices suggests a need for structured, supply chain-oriented analysis. Rather than focusing on individual strategies or single-case examples, this study maps circular interventions across eleven stages of the supply chain. This enables a more granular understanding of where circularity occurs and where significant gaps remain. Third, the risk of symbolic adoption and greenwashing highlights the need to examine not just the presence of CE strategies but also the extent to which they are operationally integrated. To address this, the study incorporates a third analytical dimension: the depth of implementation. This includes indicators such as scale, performance metrics, functional integration, and innovation investment, enabling a distinction between superficial and structural engagement.

3 Research Methodology

This chapter presents the methodological approach used to analyse how circular economy (CE) strategies are disclosed and embedded within the supply chains of five European fashion and sportswear companies. The approach is based on the framework proposed by Dragomir and Dumitru (2022). It has been adapted to examine the presence of CE strategies and their positioning and integration within supply chain practices.

3.1 Research Design

The study applies a qualitative, comparative case study design, grounded in document-based content analysis. This approach aligns with the descriptive and interpretive nature of the research, which aims to understand how circular economy (CE) strategies are presented and positioned across supply chain stages, as well as how they are embedded into organisational practice. While various theoretical models of circular economy have been developed, this research adopts a pragmatic, supply chain-focused perspective rather than relying on a single framework. Rather than striving for statistical generalisability, the objective is to generate in-depth, context-sensitive insights across various brand types, including fast

fashion, mass-market, and innovation-driven companies. Content was collected from annual or corporate sustainability reports published between 2023 and 2024. These documents serve as formal communication channels through which companies disclose their environmental and social strategies to stakeholders. These reports are increasingly standardised and externally audited, making them appropriate for comparative analysis (Kozlowski et al., 2015; Al-Hilw, 2025). A document-based approach offers practical advantages over primary data collection as it avoids the influence of social desirability bias often present in interviews, ensures consistency across companies, and allows the researcher to focus on formal corporate communication intended for stakeholders and regulatory audiences.

3.2 Case Selection

The selection of case companies followed a purposeful sampling strategy, based on recent assessments by the *Ellen MacArthur Foundation (2020)*¹ and *Fashion Revolution (2023)*², as previously applied by Dragomir and Dumitru (2022). These sources were selected for their credibility and sector-specific relevance: the Ellen MacArthur Foundation is a recognised authority on circular economy transitions, while Fashion Revolution focuses on ethical and transparent practices in the fashion sector. Both highlight companies that are noted for their engagement with sustainability, making them a relevant starting point for identifying cases. Companies were required to meet several inclusion criteria: they had to be active in the fashion retail industry, own at least one apparel brand, operate physical or franchise stores, and be publicly listed on a stock exchange. To avoid variation in regulatory contexts, only firms headquartered in Europe were considered. Beyond formal eligibility, the final sample was selected to reflect three distinct brand categories: fast fashion, mass market, and innovation-driven. This categorisation is based on differences in resource intensity, business logic, and circular maturity. Fast fashion brands are typically characterised by short production cycles, low price points, and frequent product turnover, traits that are strongly linked to environmental and social harm (Niinimäki et al., 2020). Mass-market brands target broad consumer segments with moderately priced goods and tend to adopt sustainability measures incrementally, without a fundamental business model transformation (Bieńkowska, 2023). Innovation-driven brands, by contrast, integrate sustainability into core operations, investing in design, materials, and lifecycle strategies. These brands often pioneer practices such as closed-loop recycling, bio-based materials, and product-as-a-service models (Bocken et al., 2016). This categorisation aligns with literature that emphasises the need to assess CE within differentiated business model frameworks (Boons & Lüdeke-Freund, 2012).

¹ <https://content.ellenmacarthurfoundation.org/m/7a6b4c98ea57ce7b/original/Vision-of-a-circular-economy-for-fashion.pdf>

² https://issuu.com/fashionrevolution/docs/fashion_transparency_index_2023_pages

The final sample consists of H&M and Inditex (fast fashion), Mango and OVS (mass market), and Adidas (innovation-driven). The reports include the *H&M Group Annual and Sustainability Report 2024*³, *Inditex Group Annual Report 2024*⁴, *Mango Sustainability Report 2023*⁵, *OVS Sustainability Report 2023*⁶, and *Adidas Annual Report 2024*⁷. Table 2 summarises key characteristics, including transparency levels and organisational scale.

Together, these five brands represent a broad cross-section of the European fashion sector, from high-volume models to industry benchmarks. Their diversity strengthens the comparative value of this study. The reports analysed were the most recent available at the time of data collection and covered a full fiscal year, though reporting periods may vary. All companies stated that their reports had undergone external assurance. While most reports followed the GRI framework, Adidas reported under the EU's more rigorous ESRS standards introduced by the Corporate Sustainability Reporting Directive (CSRD). The difference in reporting standards does not affect comparability. It may offer additional analytical clarity in the case of Adidas.

Name	Brand Type	Region of Origin	Transparency Index	Size (revenue)	Size (employees)
H&M	Fast fashion	Sweden	71%	Very large	Very large
Inditex	Fast fashion	Spain	50%	Very large	Very large
Mango	Mass market	Italy	49%	Large	Medium
OVS	Mass market	Spain	83%	Medium	Large
Adidas	Innovation-driven	Germany	56%	Very large	Very large

Table 2. Characteristics of Selected Fashion Companies⁸

³ <https://hmgroup.com/wp-content/uploads/2025/03/HM-Group-Annual-and-sustainability-report-2024.pdf>

⁴ https://www.inditex.com/itxcomweb/api/media/604197b9-50de-4f4f-ab84-c1e379cb3fd0/Inditex_Group_Annual_Report_2024.pdf?t=1741989136588

⁵ https://www.mangofashiongroup.com/documents/20122/89449/Mango_Memoria+sostenibilidad+2023_EN.pdf/d03186c8-6a99-803c-b81b-07fd38e568ff?t=1717759265751

⁶ https://wecare.ovscorporate.it/pdf/bilancio-sostenibilita/20240524_OVS_Report_ENG.pdf

⁷ https://report.adidas-group.com/2024/en/_assets/downloads/annual-report-adidas-ar24.pdf

⁸ Note: Size categories (e.g., 'Very large', 'Medium') are based on publicly available indicators such as annual revenue and employee count, using broad qualitative thresholds. Transparency scores were retrieved from the *Fashion Transparency Index 2023* (https://issuu.com/fashionrevolution/docs/fashion_transparency_index_2023_pages). For Inditex, a representative average of 50% was applied based on the score distribution of its portfolio brands.

3.3 Analytical Framework

To capture the complexity of circular economy (CE) positioning and implementation, this study employs a three-dimensional analytical framework that allows for both breadth and depth of analysis. The three dimensions were selected because they reflect not only the types of CE strategies companies adopt, but also where these are applied within the supply chain and how deeply they are embedded within organisational structures. This framework enables a comparison between symbolic and substantive CE engagement across different business models.

The first dimension addresses the thematic scope of CE practices. It categorises the various types of circular strategies that companies publicly report, ranging from sourcing approaches to product recovery and business model innovation. This classification helps to identify which strategic areas companies prioritise in their sustainability narratives. Based on existing taxonomies (Zorpas, 2024; Bocken et al., 2016; Dragomir and Dumitru, 2022) and refined through document analysis, the strategies were grouped into thematic categories, summarised in Table 3.

Category	Circular Economy Strategies
Sourcing & Inputs	Certified sources; Sustainable sourcing; Recycled materials; Renewable energy
Use-Phase Extension	Longer use/durability; Repair; Reuse
Resource Efficiency	Resource Efficiency; Energy efficiency; Material efficiency; Water use efficiency
Waste Reduction and Management	Waste management; Waste reduction; Chemical waste reduction; Energy waste reduction; GHG waste reduction; Material waste reduction; Water discharge reduction
Recycling & Recovery	Recycling; Chemical recycling; Energy recycling; Material recycling; Water recycling; Upcycling
Redistribution & Alternative Flows	Donation; Redistribute
Business Model Innovation	Resale (second life); Innovation

Table 3. Thematic Classification of Circular Economy Strategies

The second dimension focuses on the location of CE strategies along the supply chain, upstream, midstream, downstream, or cross-cutting. This positional mapping reveals the operational scope of CE engagement and indicates whether companies prioritise production-oriented interventions or consumer-

facing strategies. It also sheds light on whether circularity is used as a tool for systemic change or as a reputational device concentrated in the final stages of the value chain. This classification builds on existing supply chain models in the fashion industry (e.g., Niinimäki et al., 2020; Warasthe et al., 2022; Dragomir & Dumitru, 2022) and is summarised in Table 4.

Category	Supply Chain Stages
Upstream	Virgin raw material extraction and processing; Textile and material production
Midstream	Product design; Product manufacturing; Packaging, distribution, and retail
Downstream	Customer use; Post-consumer garment collection; Recycling fibres and materials
Cross-cutting/ Organizational	Ensuring transparency and traceability; Auditing and certification; Collaborations with other organizations

Table 4. Thematic Classification of Supply Chain Stages

The third dimension concerns the level of implementation maturity. Drawing on sustainability maturity models (Garcia-Torres et al., 2017; DiVito & Bohnsack, 2017), the study defines a set of five implementation dimensions to distinguish between aspirational and structurally embedded CE practices. Rather than representing sequential phases, these dimensions reflect different forms of implementation that may coexist within or across organisations. This dimension also supports the exploration of intra-organisational coherence, i.e., whether CE commitments co-occur with measurable and scalable action. The five dimensions are summarised in Table 5.

Implementation Depth	Dimension Description
Strategy and guidelines	General vision or policy references to CE, without operational specifics
Targets	Quantitative or qualitative goals set to support CE engagement
Quantitative indicators	Use of measurable indicators to monitor CE progress
Implementation at scale	CE practices integrated across brands, regions, or product lines
Research and development	Investment in innovation or experimentation aimed at circular transformation

Table 5. Thematic Classification of Implementation Depth

Together, these three dimensions support both horizontal and vertical analysis. Horizontally, by comparing CE strategy types and supply chain positioning across cases, and vertically, by assessing how deeply each strategy is embedded within individual organisations. The framework was translated into a structured coding scheme, which was systematically applied to all selected company reports. Each relevant text fragment was assessed along all three axes. This enabled triangulated insights into the structural distribution, strategic focus, and rhetorical consistency of CE discourse. The coded data were subsequently processed in spreadsheet format to enable systematic within-case and cross-case comparison.

3.4 Coding and Analysis Procedure

The coding process followed a hybrid inductive-deductive approach using NVivo (version 15.1.2). As outlined in Section 3.3, the initial codebook was based on the three-dimensional analytical framework and refined through pilot coding of H&M's report. The entire coding structure and term descriptions are provided in Appendix A. H&M was selected due to the richness of its disclosure, its use of GRI standards, and its prominence in prior sustainability research (Shen, 2014). While Adidas also offers detailed reporting under the more comprehensive ESRS framework, H&M's adherence to GRI was more closely aligned with the format used by the majority of companies in the sample. This alignment ensured methodological consistency during pilot coding. GRI remains the primary reference point for sustainability disclosures among non-financial reporters, prior to the full implementation of the CSRD (EFRAG, 2023). To enhance clarity and coherence, definitions were iteratively refined throughout the process. Although coding was conducted by a single researcher and no intercoder reliability assessment was applied, the structured nature of the framework and pilot testing helped reduce subjectivity.

Each text fragment was assessed along all three axes, CE strategy type, supply chain stage, and implementation depth, to ensure alignment with the multidimensional structure of the framework. A fragment was valid only if it aligned with at least one code in each dimension. Multiple codes could be assigned within a single dimension when a fragment addressed more than one strategy, supply chain stage, or level of implementation. Example of a coded fragment:

"In 2024, 89 percent of the materials were either recycled or sustainably sourced, of which 29.5 percent were recycled. We have also launched a new ambition for 50 percent recycled materials by 2030" (H&M, 2023).

The following codes were attached to this fragment:

- Circular Economy Strategies: Recycled materials, Sustainable sourcing.
- Supply Chain Stage: Virgin raw material extraction and processing.
- Implementation Depth: Quantitative indicators, Targets.

The number of coded items, references, and unique text fragments per brand were as follows: H&M 44 codes and 2,725 references across 158 fragments, Inditex 43 codes and 3,592 references across 174 fragments, Mango 39 codes and 4,889 references across 297 fragments, OVS 39 codes and 1,744 references across 125 fragments, and Adidas used 40 codes and 2,788 references across 143 fragments. In NVivo, a "code" refers to a distinct thematic category applied to a segment of text, while a "reference" indicates each individual instance a code was used. In the coded fragment above, five codes were applied in total, two under CE Strategies (*Recycled materials, Sustainable sourcing*), one under Supply Chain Stage (*Virgin raw material extraction and processing*), and two under Implementation Depth (*Quantitative indicators, Targets*), resulting in five references assigned to a single fragment. Data were exported to Excel to enable comparative analysis within and across companies. Due to its size, the Excel file containing the coded dataset could not be included in the appendix and is therefore submitted as a separate external attachment.

3.5 Ethical Considerations and Limitations

This study is based exclusively on secondary data derived from publicly available annual and sustainability reports. As such, it does not involve any direct interaction with human participants, the use of personal data, or access to confidential information. All documents were retrieved from official company websites and represent publicly disseminated material intended for stakeholder communication. Consequently, the study presents no ethical risk and complies with standard academic guidelines for the use of open-source data.

Although no human subjects were involved, ethical integrity was upheld through careful citation, transparent sourcing, and consistent application of the methodological framework. No content was manipulated or selectively omitted, and all documents were analysed in full. Interpretations of company statements were developed with attention to context, aiming for fairness and alignment with the communicative intent of the source material. However, the use of corporate reports introduces several methodological limitations. First, such reports are inherently self-representational and may be shaped by branding strategies, regulatory requirements, or reputational concerns. This increases the risk of

greenwashing, whereby companies present themselves as more sustainable than they are in practice (Garcia-Torres et al., 2017). To mitigate this, the study employs a critical lens and compares disclosures across cases. Although only one report per company was analysed, horizontal triangulation was achieved by comparing five companies across different brand types and strategic orientations. Second, the analysis is limited to what companies choose to disclose. Non-disclosure of internal decision-making, failed initiatives, or adverse outcomes may bias perceptions of CE implementation. While the coding framework helps distinguish between symbolic and substantive engagement, it cannot fully compensate for omissions or selective transparency. The findings are not intended to be generalised beyond the specific scope of this study. They apply to large multinational fashion brands operating in or influenced by European regulatory frameworks. Smaller firms, non-European companies, or informal sector actors may encounter fundamentally different barriers and opportunities in implementing circular economy principles.

These limitations do not undermine the study's validity but rather serve to contextualise its scope. The research acknowledges the limitations of secondary data and employs a systematic comparative framework to ensure methodological robustness. By focusing on corporate reporting, it offers critical insight into how CE implementation is framed and communicated within the European fashion industry.

The analytical framework developed in this chapter forms the basis for the analysis that follows. By applying the three core dimensions to annual and sustainability reports, the study translates methodological design into structured empirical insight.

4 Findings and Discussion

This chapter presents the findings from the comparative case study based on content analysis of five European fashion and sportswear brands, as outlined in the analytical structure presented in the previous chapter. It is organised into three main sections. Section 4.1 examines the strategic focus of circular economy (CE) strategies, particularly the types of strategies reported and their positioning along the supply chain. Section 4.2 explores the depth of implementation, focusing on how CE strategies are embedded in organisational practices and reporting structures. Finally, Section 4.3 offers a synthesis and discussion of the findings, highlighting strategic patterns, tensions, and implications for understanding circular maturity in the fashion sector. Together, these sections provide a detailed, supply chain-wide view of how circular economy principles are interpreted and presented across different business models, as reflected in annual and sustainability reports.

To ensure transparency and traceability, all coded data from NVivo has been exported into an Excel file. Due to the extensive volume of data, these tables are not included in the main body of the dissertation or the appendix; instead, they are submitted as a separate attachment. The findings presented in this chapter are directly based on these coded outputs and serve as the empirical foundation for both within-case and cross-case comparisons.

4.1 Strategic Focus: Circular Economy Strategy Types and Supply Chain Positioning (RQ1)

This section addresses the first research question: *Which circular economy (CE) strategies are applied by the selected fashion companies, and at which stages of the supply chain are these strategies positioned?*

The analysis focuses on two dimensions: the types of CE strategies most frequently reported, and where in the supply chain these strategies are positioned. As the analysis draws on self-reported data, the results should be understood as representations of disclosure rather than verified indicators of operational reality. Together, these patterns reveal how companies construct their narratives for a circular economy and which areas of the supply chain receive the most attention. The results are presented in three parts. Section 4.1.1 examines the most commonly reported CE strategies. Section 4.1.2 shifts the focus to supply chain positioning, and Section 4.1.3 compares strategic approaches across the different brand types.

4.1.1 Most Common CE Strategies

Figure 1 shows the distribution of the top seven circular economy (CE) strategies reported by each of the five selected fashion and sportswear brands. Based on the number of coded references, it illustrates how companies frame their engagement with CE in public disclosures. The figure reveals notable variation in strategic emphasis: rather than addressing all CE strategies evenly, most brands focus on a recurring subset of strategies.

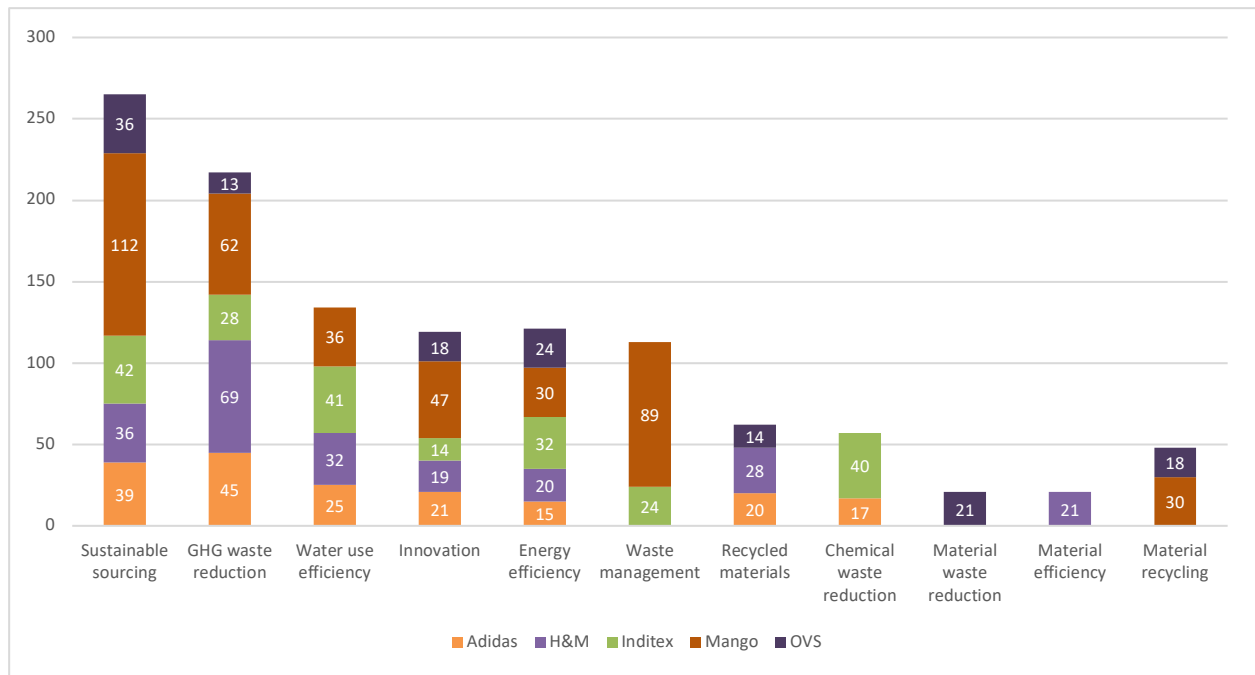


Figure 1. Distribution of Circular Economy Strategies per Brand

4.1.1.1 Strategy Bundling: Co-occurrence Patterns

To understand how circular economy (CE) strategies are related in reporting, a co-occurrence analysis was performed using coded reporting fragments. Table 6 displays the percentage of fragments in which a given strategy (row) was co-coded with another (column). These values reflect how frequently companies narratively combine different CE strategies within the same textual units.

	Recycled materials	Material efficiency	Water use efficiency	Sustainable sourcing	Waste management	GHG waste reduction
Innovation	18.5%	11.8%	8.4%	34.5%	13.4%	19.3%
Recycled materials	100.0%	27.2%	2.2%	66.3%	10.9%	12.0%
Energy efficiency	1.7%	2.5%	19.0%	7.4%	5.0%	42.1%
Material efficiency	43.1%	100.0%	3.4%	39.7%	25.9%	17.2%
Chemical waste reduction	0.0%	2.5%	40.5%	6.3%	11.4%	5.1%

Table 6. Co-occurrence Table of CE-strategies⁹

⁹ Dark grey shading indicates co-occurrence above the 50% threshold; light grey shading indicates co-occurrence above the 25% threshold.

To distinguish between meaningful and incidental combinations, a relative co-occurrence threshold of 25% was applied. A second strategy had to appear in at least 25% of the fragments coded with the first strategy to be considered analytically relevant. This threshold was selected pragmatically, balancing interpretive sensitivity with analytical focus. Lower thresholds risked capturing coincidental overlaps, while higher ones might obscure moderately recurring but thematically significant links.

The analysis reveals several patterns of strategy bundling. First, sourcing-related combinations stand out most clearly: 'recycled materials' co-occurs with 'sustainable sourcing' in 66.3% of cases, and with 'material efficiency' in 27.2%. Conversely, 'material efficiency' co-occurs with 'recycled materials' in 43.1%, further confirming the strong narrative link between material selection, sourcing, and efficiency. This suggests a coherent narrative cluster around input circularity, substitution, and quality control. Similarly, 'material efficiency' and 'waste management' co-occur in 25.9% of fragments, reflecting a logic of waste minimisation through design or processing improvements. A second grouping centres on operational impact strategies, most notably the strong co-occurrence of 'energy efficiency' and 'GHG waste reduction' (42.1%). This pairing reflects how energy use and emissions are frequently framed together in corporate discourse, likely due to shared reporting structures or regulatory expectations. Third, links between 'innovation' and other strategies are present, but occur more selectively. 'Innovation' most frequently co-occurs with 'sustainable sourcing' (34.5%) and, to a lesser extent, with 'recycled materials' and 'GHG waste reduction'. These rates fall near or just below the analytical threshold, suggesting that while innovation is connected to other domains, it is not yet structurally embedded across the board. Only one pairing stands out in the context of pollution and resource protection: 'chemical waste reduction' and 'water use efficiency' co-occur in 40.5% of fragments. This reflects a production-oriented logic that links chemical management and water use efficiency. It aims to reduce water pollution by improving the handling of both hazardous substances and water-intensive processes. Most high-frequency pairings occur within the same overarching strategy category as defined in Table 3, particularly within *Sourcing & Inputs* and *Resource Efficiency*. This suggests that CE reporting remains thematically siloed, with limited integration across domains. Exceptions, such as the links between 'innovation' and 'recycled materials' or between 'energy efficiency' and 'water use efficiency', indicate emerging, but still inconsistent, efforts to frame CE strategies in more integrated terms.

In sum, the findings highlight that companies not only choose which strategies to report but also how to configure them narratively. Some instances of bundling appear intentional, but overall, the CE discourse remains fragmented. CE strategy clusters exist, yet they rarely connect across different thematic areas.

4.1.1.2 Brand-Level CE Strategy Profiles

This section highlights the most distinctive aspects of how each brand reports its circular economy (CE) strategies, as depicted in Figure 1. The analysis draws on the thematic framework outlined in Table 3, which groups individual initiatives into seven overarching strategy categories. Rather than providing exhaustive summaries, the focus lies on notable emphases, omissions, or narrative patterns that distinguish each brand from the others.

H&M places particular emphasis on the strategy categories *Sourcing & Inputs* and *Waste Reduction and Management*, with ‘sustainable sourcing’ and ‘GHG emissions reduction’ standing out most prominently. While other CE strategies are referenced, they remain peripheral, indicating a reporting focus that leans toward input control and environmental compliance rather than systemic transformation.

Inditex similarly highlights *Sourcing & Inputs*, primarily through a strong focus on ‘sustainable sourcing’. This is complemented by references to ‘chemical waste reduction’ and a broader range of *Resource Efficiency* initiatives. Its disclosure reflects a process-oriented approach, with moderate variation across strategy categories and a slightly more diversified narrative than H&M.

Mango’s reporting profile is similarly concentrated in conventional strategy categories, particularly *Sourcing & Inputs*, *Waste Reduction and Management*, and *Resource Efficiency*. The brand frequently reports on ‘sustainable sourcing’ and ‘waste management’, and pays moderate attention to ‘innovation’, which falls under the *Business Model Innovation* category. This suggests that Mango’s circularity efforts are primarily focused on improving existing operations.

OVS stands out through its emphasis on *Recycling & Recovery*, particularly ‘material recycling’, which is more prominently reported compared to other brands. In addition, the brand gives regular attention to *Resource Efficiency* topics such as ‘water use efficiency’, ‘material efficiency’, and ‘innovation’. This combination suggests a balanced approach that prioritises both environmental impact reduction and technical process optimisation.

Adidas, by contrast, presents the most evenly distributed profile. The brand reports actively across a broad range of CE strategies, including ‘innovation’, ‘recycled materials’, and ‘energy efficiency’. No single strategy dominates, resulting in a reporting profile that appears balanced and narratively consistent. This breadth suggests a deliberate effort to integrate circularity across multiple thematic areas.

Taken together, these brand-level profiles reveal a shared emphasis on *Sourcing & Inputs* and *Waste Reduction and Management*, with *Resource Efficiency* also frequently cited. By contrast, categories such as *Use-Phase Extension*, *Redistribution & Alternative Flows*, and *Business Model Innovation* are reported less often. These patterns highlight a preference for strategies that align with existing operational

routines, while more transformative or consumer-facing strategies are reported less consistently. These reporting tendencies set the stage for a more detailed examination of how CE strategies are positioned along the supply chain (Section 4.1.2) and compared across brand types (Section 4.1.3).

4.1.2 Supply Chain Positioning of CE Strategies

Building on the preceding analysis of reported CE strategies, this section examines how these strategies are positioned across the supply chain. The analysis encompasses eleven defined stages, spanning from raw material extraction and processing to post-consumer recovery and recycling. CE strategies were coded based on the supply chain stage(s) referenced in their narrative context, allowing for allocation to multiple stages where applicable. Figure 2 maps the distribution of these strategies across the eleven stages. It shows that most reported activity is concentrated in 'product manufacturing', 'textile and material production', and 'packaging, distribution, and retail'. In contrast, downstream stages are referenced far less frequently.

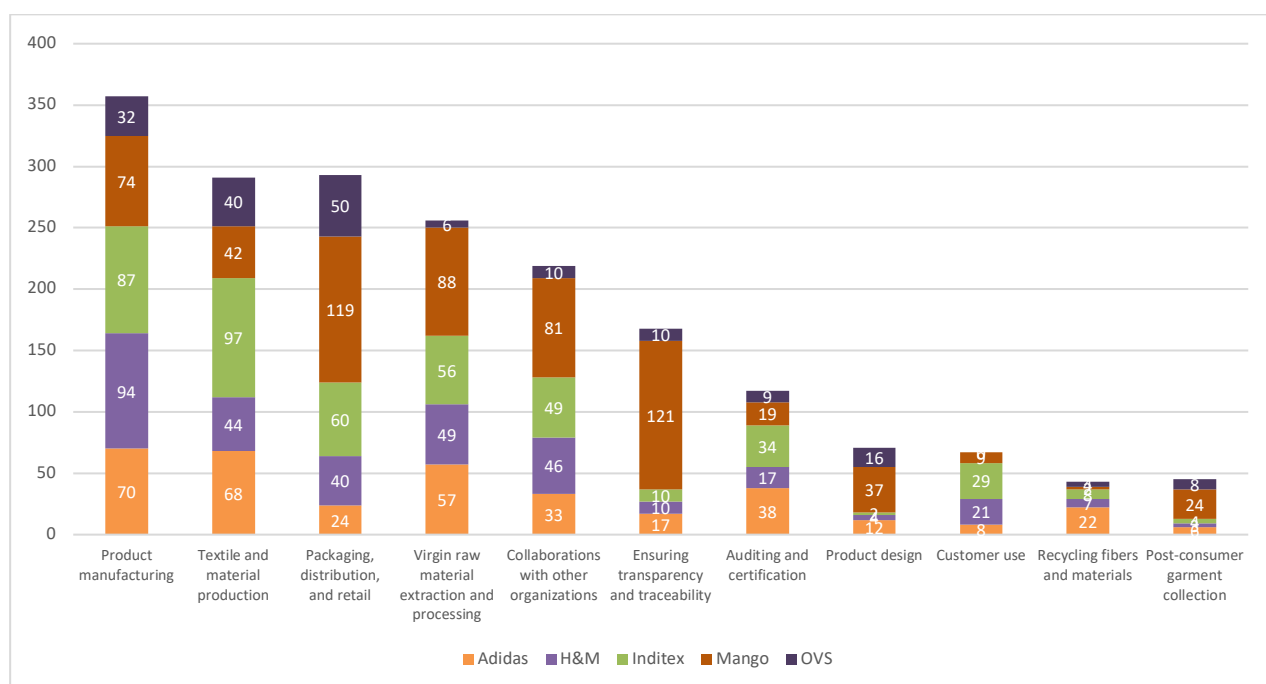


Figure 2. Distribution of Supply Chain Stages per Brand

4.1.2.1 CE Strategies per Supply Chain Stage

Figure 3 extends the preceding analysis by aggregating the eleven supply chain stages into four broader categories, as defined in Table 4, and linking them to the different CE strategy categories. This figure

enables a thematic analysis of where circular strategies are concentrated across both supply chain categories and strategic CE themes.

The majority of CE categories are concentrated in the upstream and midstream stages of the supply chain, particularly in areas such as ‘textile and material production’, ‘product manufacturing’, and ‘packaging, distribution, and retail’. These stages align closely with the most reported CE categories, such as *Sourcing & Inputs*, *Resource Efficiency*, and *Waste Reduction and Management*. These strategies are typically reported in domains where companies maintain a high degree of operational control, supported by established reporting structures and supplier oversight.

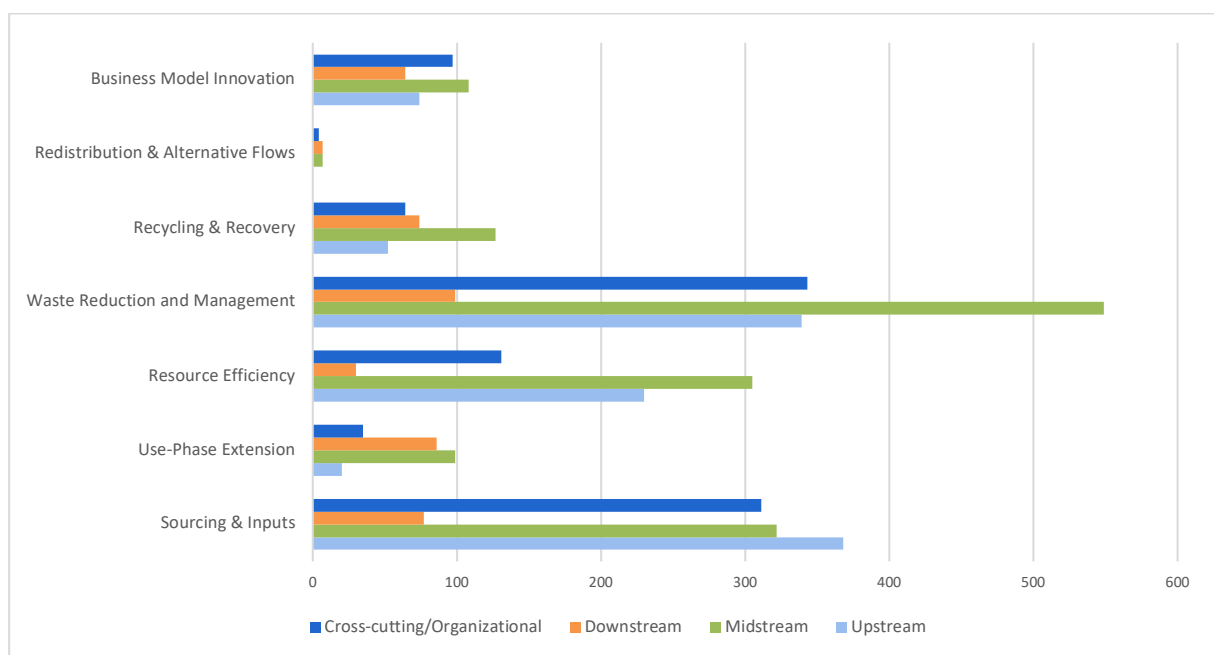


Figure 3. Distribution of Circular Economy Strategy Categories across Supply Chain Categories

In contrast, cross-cutting strategies, such as ‘transparency and traceability’, ‘auditing and certification’, and ‘collaboration with other organisations’, receive far less attention. While occasionally mentioned in strategic narratives, they are rarely associated with a wide range of CE strategies or elaborated in operational detail. Finally, downstream stages, including ‘customer use’, ‘post-consumer garment collection’, and ‘recycling of fibres and materials’, are the least frequently reported. CE categories such as *Use-Phase Extension* and *Redistribution & Alternative Flows* appear only sporadically. They are often framed in broad or aspirational terms, indicating that end-of-life engagement remains limited in CE reporting.

Overall, the supply chain positioning of CE categories reveals a narrative emphasis on production-centric domains. While upstream and midstream stages dominate corporate disclosures, downstream and cross-cutting efforts remain peripheral, indicating a reporting logic that prioritises internal control over broader system-level transformation.

4.1.2.2 Brand-Level Supply Chain Profiles

Building on the patterns observed in Figures 1, 2 and 3, this section highlights how each brand positions its circular economy (CE) strategies across the supply chain. The focus lies on distinctive emphases per brand, using only the CE strategy categories and individual strategies defined in Table 3, as well as the supply chain categories outlined in Table 4. More detailed tables underlying this analysis are available in the separate Excel file submitted alongside this dissertation.

H&M concentrates its strategies in *upstream* and *midstream* stages, with a strong focus on *Sourcing & Inputs* and *Waste Reduction and Management*. *Downstream* and *cross-cutting* categories are present but less developed.

Inditex shows a balanced distribution across *upstream* and *midstream* stages, with strong reporting on *Waste Reduction and Management* and *Resource Efficiency*. *Downstream* and *cross-cutting* categories are present but less central, with moderate emphasis on *Use-Phase Extension* and *Business Model Innovation*. Mango places most of its circular reporting in *midstream* operations, with a particular focus on ‘sustainable sourcing’, ‘waste management’, and energy-related strategies. *Cross-cutting* engagement is also visible, while *upstream* and *downstream* categories receive relatively little attention.

OVS places most emphasis on *midstream* categories, particularly around ‘sustainable sourcing’, ‘recycled materials’, ‘material efficiency’, and ‘waste management’. ‘Repair’ and ‘innovation’ also feature in the product and distribution stages. *Upstream* strategies are present to a lesser extent, while *downstream* and *cross-cutting* categories remain peripheral.

Adidas distributes its CE strategies across the entire supply chain, with strong reporting on *Waste Reduction and Management* and *Sourcing & Inputs*. *Resource efficiency* is consistently addressed, while *downstream* efforts, such as recycling and post-consumer collection, are less visibly integrated. *Cross-cutting* strategies and *business model innovation* suggest a more embedded, system-oriented approach.

Taken together, the brand-level profiles reflect distinct patterns of supply chain engagement. H&M and Inditex emphasise upstream and midstream strategies, though Inditex also includes moderate downstream and cross-cutting activity. Mango places a strong emphasis on midstream reporting, particularly in areas such as sourcing and operational efficiency. In contrast, it shows limited engagement

in upstream and downstream activities. OVS also focuses mainly on midstream categories and specific strategies such as repair and innovation. However, its downstream and cross-cutting efforts remain limited. Adidas is the only brand to show consistent coverage across all supply chain categories, combining upstream, downstream, and cross-cutting strategies with a broader systemic approach.

4.1.3 Cross-Case Comparison by Brand Type

This section offers a comparative analysis of how circular economy (CE) strategies are distributed and positioned across three brand types: fast fashion, mass market, and innovation-driven. Drawing on Figures 4, 5, and 6, the analysis considers not only the structural distribution of CE activity across the supply chain but also the strategic logic behind where and how brands invest in circularity. Each figure combines two views: the large pie chart shows which supply chain categories receive the most attention. In contrast, the smaller chart reveals which CE categories dominate within the most reported stage. Although the second chart zooms in on the largest supply chain category from the first chart, its percentages are calculated relative to the overall total, as if the strategy categories were part of the same circle. As a result, the values of the second pie do not add up to 100% but instead represent the share of each CE category within the most frequently reported category stage in the first chart. Together, they expose not only coverage but also strategic priorities, blind spots, and internal coherence, or lack thereof.

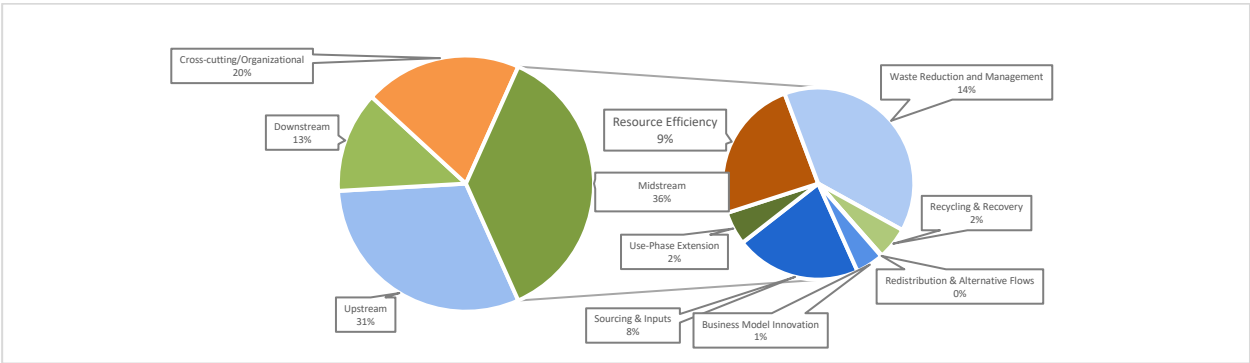


Figure 4. Fast Fashion: Supply Chain Category Distribution and CE Strategy Composition

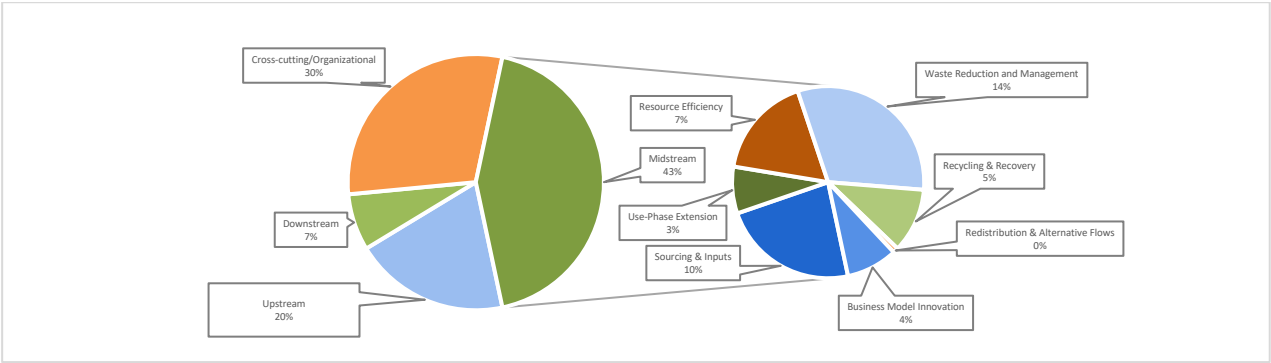


Figure 5. Mass Market: Supply Chain Category Distribution and CE Strategy Composition

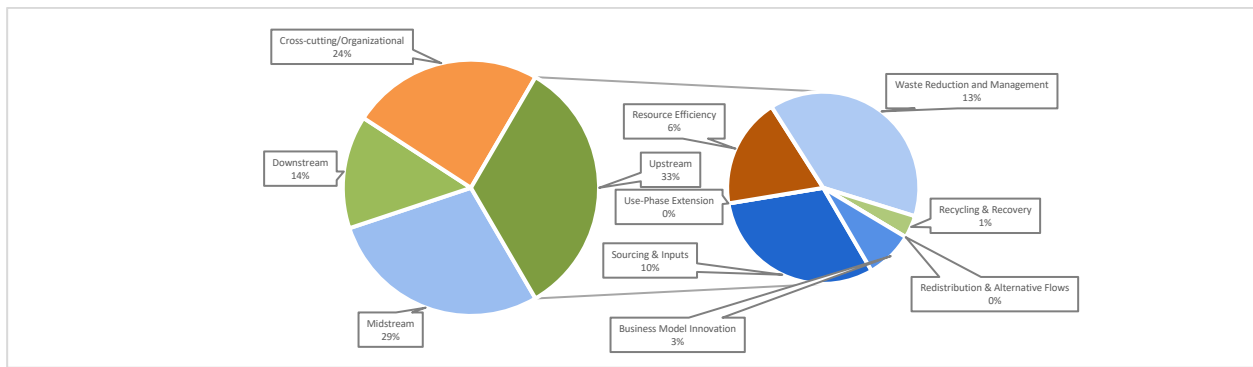


Figure 6. Innovation-Driven: Supply Chain Category Distribution and CE Strategy Composition

While all brand types engage with CE in some form, they diverge sharply in how and where they apply it. For fast fashion brands, the distribution of CE strategy categories is concentrated in upstream and midstream stages, which together account for two-thirds of reported activity. This reflects a strong alignment with conventional production domains such as material sourcing and manufacturing. The focus lies on CE categories such as *Waste Reduction and Management*, *Resource Efficiency*, and *Sourcing & Inputs*, suggesting a prioritisation of efficiency gains and environmental compliance. Cross-cutting strategies receive some attention, yet downstream engagement remains limited. The near absence of *Use-Phase Extension*, *Redistribution & Alternative Flows*, and *Business Model Innovation* suggests a narrow interpretation of circularity, one that reinforces existing operational routines rather than challenging the logic of linear value creation.

Mass market brands show an intense concentration of CE strategies in midstream operations, particularly in manufacturing and distribution. While cross-cutting initiatives are relatively prominent, they are not anchored in a broader shift toward circular integration. Upstream engagement is moderate, and downstream activity remains limited. The CE strategy mix is dominated by *Waste Reduction and Management*, followed by *Sourcing & Inputs* and *Resource Efficiency*, reinforcing a focus on process efficiency. Meanwhile, categories such as *Business Model Innovation* and *Redistribution & Alternative Flows* remain underdeveloped or absent. This suggests that although mass market brands incorporate some cross-functional elements, their approach to circularity remains largely operational and risk-oriented, rather than transformative.

Innovation-driven brands demonstrate the broadest supply chain engagement among the three types, with CE categories spanning all four stage categories. However, upstream and midstream stages remain dominant, together accounting for over 60% of reported activity. Cross-cutting strategies are also well-represented, while downstream engagement, although more developed than in other types, remains less prominent. The CE category mix suggests that while these brands frame circularity more comprehensively,

engagement with systemic strategies such as *Business Model Innovation* or *Recycling & Recovery*, remains limited, pointing more toward strategic signalling than structural change.

These contrasts reveal more than differences in emphasis or reporting tone. They reflect fundamentally different interpretations of what circular economy means in practice. Fast fashion brands manage circularity as a compliance-driven production concern, tightly aligned with efficiency and risk mitigation. Mass market brands adopt a slightly broader scope, layering in cross-functional elements but stopping short of structural integration. Innovation-driven brands, while engaging more broadly across the supply chain, tend to signal ambition rather than embed transformation, hinting at the potential of circularity without fully activating it.

Ultimately, these findings underscore that CE maturity is shaped as much by narrative positioning as by strategic content. The distribution of strategies along the supply chain reveals how brands perceive agency, responsibility, and control. Persistent silences in downstream and systemic categories, particularly *Use-Phase Extension*, *Business Model Innovation*, and *Redistribution & Alternative Flow*, suggest that circularity often remains bounded by operational logic. Notably, all brands, regardless of business model, consistently prioritise the same three CE categories: *Waste Reduction and Management*, *Sourcing & Inputs*, and *Resource Efficiency*. This convergence reinforces the notion that circularity is interpreted through the lens of operational optimisation rather than systemic transformation. The gap between comprehensive framing and embedded transformation marks the key tension that defines the current landscape of circular maturity.

4.2 Implementation Depth: Circular Economy Integration Across Organisational Levels (RQ2)

This section addresses the second research question: *To what extent are circular economy (CE) strategies integrated into companies' operations in terms of implementation depth?*

The analysis examines how companies present narratives of implementation maturity in publicly disclosed reports. These documents are not treated as evidence of operational reality, but as reflections of how circularity is framed across five dimensions of reported implementation. The section is organised into three analytical components. Section 4.2.1 examines which implementation dimensions are most frequently referenced. Section 4.2.2 explores how different CE strategy categories are framed in terms of implementation depth. Finally, Section 4.2.3 compares the reported degree of integration across brand types, identifying broader differences in strategic orientation and organisational coherence.

4.2.1 Distribution of Implementation Dimensions

Figure 7 visualises the relative frequency with which each of the five implementation dimensions appears across the selected brands. The most commonly reported dimension is *Strategy and Guidelines*, indicating that most circular economy (CE) initiatives are positioned within high-level policy or vision statements. This is followed by *Quantitative Indicators* and *Targets*, which suggest some degree of performance orientation but do not necessarily imply structural embedding. By contrast, *Implementation at Scale* and *Research and Development* are referenced less frequently, highlighting a more limited narrative presence of deep or systemic engagement. This distribution suggests that while CE strategies are widely acknowledged at the strategic level, their operational anchoring remains selective and uneven across brands.

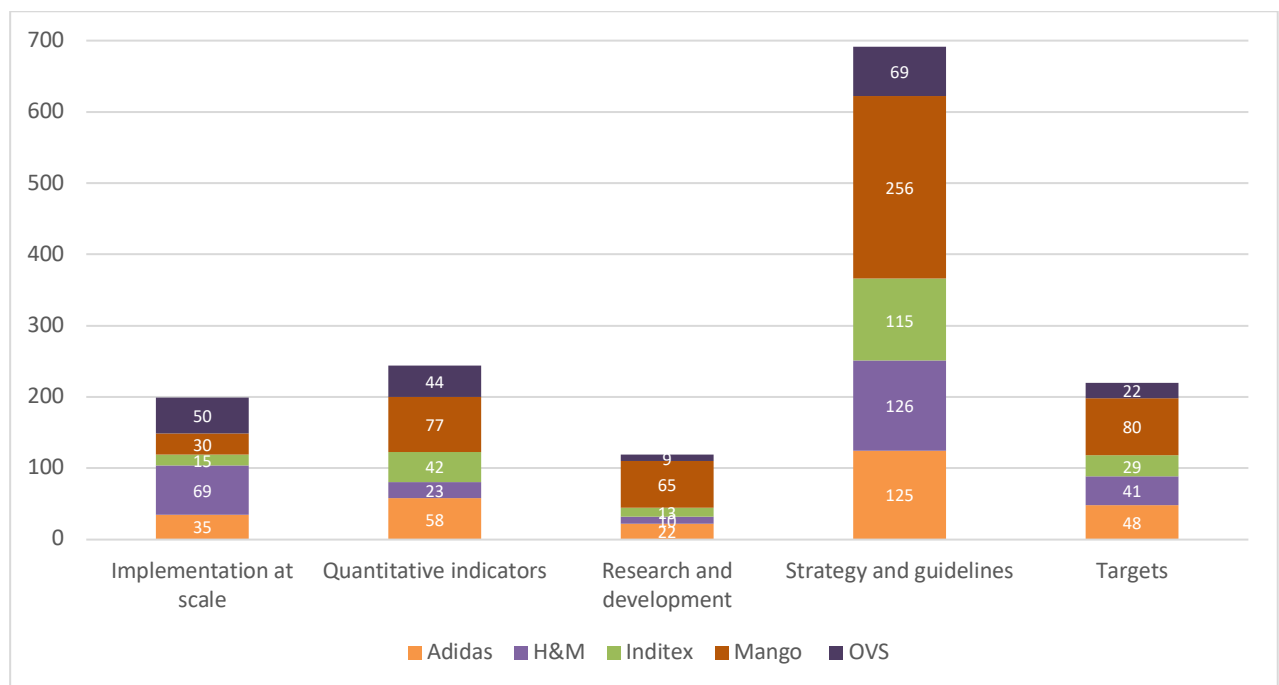


Figure 7. Distribution of Implementation Dimensions per Brand

4.2.1.1 Implementation Depth: Co-occurrence Patterns

As a first step beyond analysing the frequency of individual implementation dimensions, it is valuable to examine how often these dimensions are reported together within the same narrative fragment. This provides insight into whether circular economy (CE) strategies are framed as part of a structurally embedded approach across organisational layers or remain isolated within a single dimension of discourse. Table 7 presents a co-occurrence matrix that shows the percentage of fragments in each row that were also coded with the corresponding column dimension. For example, among all fragments coded

as *Research and Development*, 60.8% were also coded with *Strategy and Guidelines*. In comparison, only 10.5% of fragments coded as '*Strategy and Guidelines*' also included '*Research and Development*'. The matrix reflects directional relationships (row → column), enabling a nuanced reading of narrative clustering. As in Section 4.1.1.2, a 25% threshold is used to distinguish analytically meaningful co-occurrences from incidental overlap.

	Implementation at scale	Quantitative indicators	Research and development	Strategy and guidelines	Targets
Implementation at scale	100.0%	28.5%	8.5%	57.0%	14.0%
Quantitative indicators	23.3%	100.0%	13.1%	56.3%	35.1%
Research and development	14.2%	26.7%	100.0%	60.8%	15.8%
Strategy and guidelines	16.3%	19.8%	10.5%	100.0%	23.5%
Targets	12.6%	38.6%	8.5%	73.5%	100.0%

Table 7. Co-occurrence Table of Implementation Dimensions¹⁰

All four dimensions show strong co-occurrence with *Strategy and Guidelines*. This clustering suggests that even the more operational or innovation-oriented aspects of CE reporting are consistently anchored in broader strategic narratives. Rather than being framed independently, these dimensions appear to rely on policy-level language for legitimacy and coherence. Yet this alignment tends to flow in one direction. The results point to a notable asymmetry. More embedded dimensions, such as *Research and Development* and *Implementation at Scale*, frequently appear alongside *Strategy and Guidelines*. However, the reverse is far less common: only 16.3% of fragments coded as *Strategy and Guidelines* also reference *Implementation at Scale*, and just 10.5% include *Research and Development*. This asymmetry implies that strategic commitments are often used to legitimise advanced CE practices, whereas policy-level statements rarely extend into operational specifics. A similar pattern emerges with *Targets* and *Quantitative Indicators*. Although *Targets* and *Quantitative Indicators* suggest some orientation towards performance management, their links to more embedded dimensions remain limited. Among fragments coded as *Targets*, only 12.6% also reference *Implementation at Scale*, and 8.5% include *Research and Development*. For *Quantitative Indicators*, these co-occurrence rates are slightly higher. This raises

¹⁰ Dark grey shading indicates co-occurrence above the 50% threshold; light grey shading indicates co-occurrence above the 25% threshold.

questions about whether target-setting is primarily symbolic, rather than supported by more profound organisational transformation.

Overall, the co-occurrence patterns reveal a structural disconnect between discursive ambition and operational framing. CE narratives tend to concentrate on strategic intent, while only a limited subset demonstrates coherent alignment across multiple implementation dimensions.

4.2.1.2 Brand-Level Implementation Profiles

Due to the strong co-occurrence of all implementation dimensions with *Strategy and Guidelines*, the brand-level analysis is built directly on the co-occurrence matrix. The co-occurrence matrices per brand are presented in Appendix B. Consistent with the analytical threshold introduced in Section 4.1.1.2, only combinations with a co-occurrence rate exceeding 25% are discussed, with values above 50% interpreted as strong indicators of narrative integration. While all five firms reference circular economy (CE) strategies across multiple implementation dimensions, the degree of structural alignment varies considerably. This section focuses not on exhaustive descriptions but on highlighting where CE appears to be structurally embedded versus where it remains symbolic or fragmented.

H&M's reporting places strong emphasis on performance tracking. The clearest indication of this is the co-occurrence between *Targets* and *Quantitative Indicators* (75.9%), with a reciprocal reference from *Quantitative Indicators* back to *Targets* (52.4%). *Research and Development* is mainly tied to *Strategy and Guidelines* (61.5%), suggesting that innovation is acknowledged at the strategic level but is less frequently operationalised. *Implementation at Scale* also demonstrates moderate alignment with both *Strategy* and *Quantitative Indicators*, indicating a selective application beyond pilot initiatives.

In the case of Inditex, the strongest link is between *Quantitative Indicators* and *Implementation at Scale* (78.3%), indicating that CE actions are not only tracked but also presented as integrated into operations. Further alignment is visible through frequent co-occurrence of *Targets* and *Strategy* (73.8%), as well as *Strategy* and *Implementation at Scale* (50.7%). *Research and Development* also features in conjunction with strategic framing and scaling, further embedding innovation within the structure.

Mango's profile is dominated by top-down alignment. The clearest associations appear between *Targets* and *Strategy and Guidelines* (89.0%), *Implementation at Scale* and *Strategy* (83.3%), and *Quantitative Indicators* and *Strategy* (78.5%). *Research and Development* is most notably connected to *Strategy* and *Quantitative Indicators*, which suggests that although innovation is conceptually acknowledged, its practical execution remains more limited in scope.

The reporting structure of OVS centres on quantifiable performance. Key pairings include *Targets* and *Quantitative Indicators* (50.0%), *Quantitative Indicators* and *Implementation at Scale* (45.5%), and *Implementation at Scale* and *Quantitative Indicators* (40.0%), pointing to a consistent logic of measurement and action. In contrast, links to *Strategy* or *Research and Development* appear less frequently, suggesting a reporting pattern focused more on operational outputs than on strategic or innovation-led transformation.

Adidas presents the most integrated profile among the five brands. The strongest co-occurrences are observed between *Targets* and *Strategy* (87.5%), *Implementation at Scale* and *Strategy* (85.7%), and *Targets* and *Quantitative Indicators* (82.5%). Additional links, such as those between *Strategy*, *Indicators*, and *Research and Development*, underscore a high degree of narrative coherence across all implementation dimensions. Adidas is the only brand in the sample that consistently integrates CE across strategic ambition, performance monitoring, innovation, and deployment.

Together, these profiles confirm that while strategic language and target-setting are widely used, their connection to innovation and scaling remains uneven. H&M and OVS demonstrate a more symbolic or operationally narrow use of CE language. Inditex and Mango exhibit a selective yet structured alignment, particularly in terms of performance metrics and strategy. Only Adidas demonstrates full-spectrum integration, consistently linking CE strategy with innovation, monitoring, and scaled implementation. These distinctions reinforce earlier findings that advanced implementation elements, especially *Research and Development*, are often only loosely connected to core strategic frameworks in most brands, with Adidas as the key exception.

4.2.2 Implementation Depth across CE Strategies

After examining the implementation dimensions that co-occur within reporting structures, this section shifts its focus to the CE strategies. The emphasis lies on how different circular economy (CE) strategies are embedded across the five implementation dimensions. This approach highlights structural variation in the maturity and positioning of specific themes within sustainability reporting.

4.2.2.1 Implementation Depth by Strategy Type

Figure 8 illustrates that the depth of implementation across circular economy (CE) strategies is highly uneven, with apparent variation in how strategies are embedded across the five implementation dimensions.

Waste Reduction and Management dominates the landscape, with consistently high scores across all dimensions, especially *Implementation at Scale*, *Quantitative Indicators*, and *Targets*. This suggests that brands prioritise waste-related strategies not only in framing but also in operational execution, likely due to their compatibility with existing compliance and efficiency frameworks.

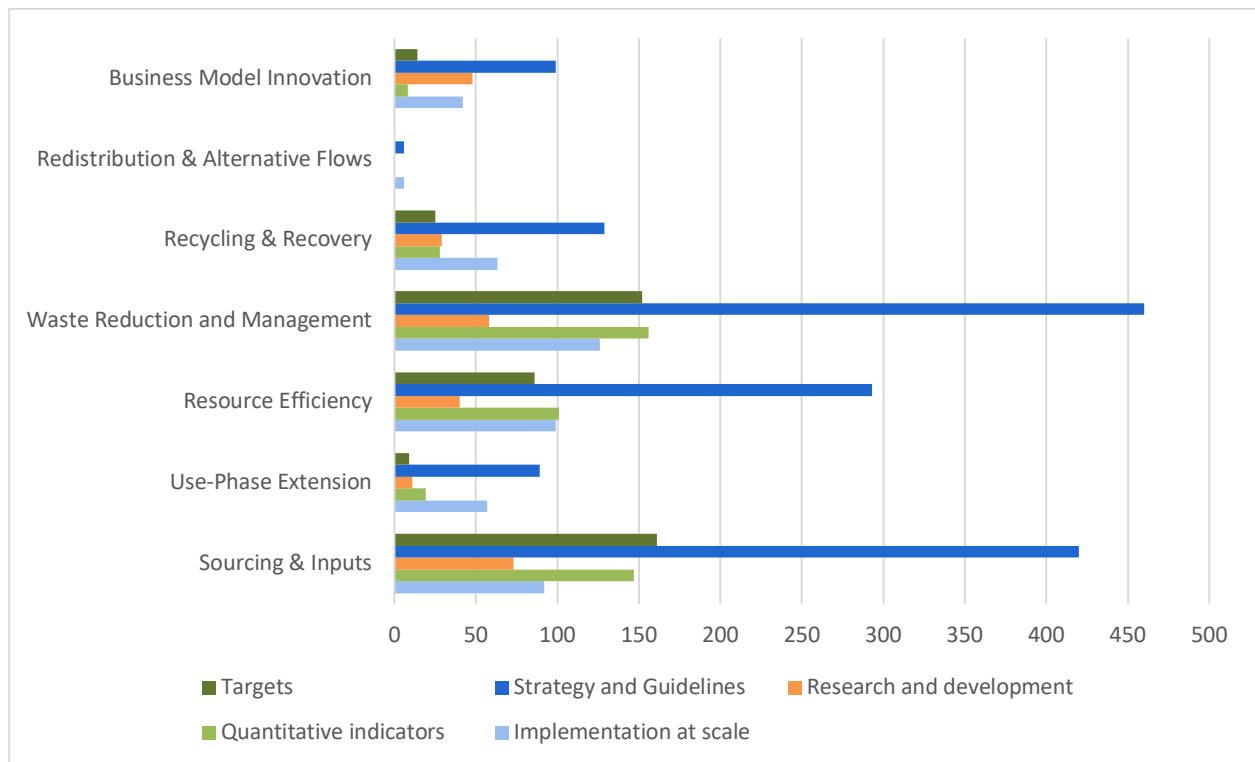


Figure 8. Distribution of Circular Economy Strategy Categories across Implementation Dimensions

Sourcing & Inputs also ranks prominently, particularly in *Strategy and Guidelines*, *Targets*, and *Quantitative Indicators*. However, it remains underdeveloped in terms of *Research and Development* and *Implementation at Scale*, indicating a focus on reputational assurance and regulatory alignment rather than transformation.

Resource Efficiency follows a similar pattern. It is frequently tracked through *Quantitative Indicators* but is only modestly integrated into *Research and Development* or *Strategy and Guidelines*. Its implementation reflects technical optimisation over systemic change.

Recycling & Recovery occupies a middle position. It is present across dimensions but with slightly lower intensity, suggesting a degree of operational maturity, especially in brands with closed-loop or take-back systems. However, it remains less central to core production-focused strategies.

Use-Phase Extension, encompassing durability, repair, and reuse, shows scattered representation, particularly weak in *Implementation at Scale* and *Research and Development*. These strategies are often referenced in symbolic terms or linked to consumer behaviour, without strong organisational embedding.

Redistribution & Alternative Flows is the least represented strategy, barely visible across any implementation dimension. Despite growing rhetorical interest in second-life models or donation systems, these strategies remain peripheral and lack structural support in reporting.

Similarly, *Business Model Innovation* is also one of the least developed CE strategies, both in terms of reporting frequency and implementation depth. Its limited presence across dimensions such as *Implementation at Scale*, *Research and Development*, and *Targets* highlights the ongoing gap between ambition and integration.

In summary, strategies closely aligned with existing reporting structures, such as waste and sourcing, receive the most comprehensive implementation. In contrast, downstream and innovation-driven strategies remain underdeveloped, pointing to a continued challenge in embedding circularity beyond established routines.

4.2.2.2 Brand-Level Patterns in CE Strategy Implementation

This section examines how individual brands report on the implementation of circular economy (CE) strategies, with a focus on how strategic intent is translated into action. The analysis considers which types of strategies are prioritised per brand and how they are embedded across the five implementation dimensions. More detailed tables underlying this analysis are available in the separate Excel file submitted alongside this dissertation.

H&M emphasises *Waste Reduction and Management*, *Resource Efficiency*, and *Sourcing & Inputs*, with a strong presence across both strategic and performance-oriented dimensions. These strategies are deeply embedded in *Strategy and Guidelines*, *Targets*, and *Quantitative Indicators*. However, innovation-related dimensions, particularly *Research and Development* and *Implementation at Scale*, remain weak. Downstream strategies such as *Business Model Innovation* and *Use-Phase Extension* are present but lack operational depth, suggesting a traditional focus on upstream efficiency rather than systemic change.

Inditex shows a highly selective but intense CE profile. *Waste Reduction and Management* dominate the implementation landscape, followed by *Resource Efficiency* and *Sourcing & Inputs*. These are well distributed across all dimensions, including *Implementation at Scale*. However, the brand gives minimal attention to downstream or transformative strategies, such as *Redistribution & Alternative Flows* or *Business Model Innovation*, reflecting a preference for mature, compliance-aligned practices.

Mango combines broad CE reporting with noticeable structural gaps. While *Waste Reduction and Management*, *Sourcing & Inputs*, and *Resource Efficiency* are widely reported and span most dimensions, especially *Strategy and Guidelines*, *Targets*, and *Quantitative Indicators*, innovation and *Research and*

Development remain modest. *Business Model Innovation* is more visible here, but *Redistribution & Alternative Flows* and *Use-Phase Extension* are only lightly integrated, indicating a strong operational core without profound transformation.

OVS displays the most balanced distribution of CE strategies across implementation dimensions. Key strategies, such as *Sourcing & Inputs*, *Resource Efficiency*, and *Waste Reduction and Management*, are supported across all five layers, including *Implementation at Scale* and *Quantitative Indicators*. Notably, *Use-Phase Extension* is more consistently embedded than in any other brand. While *Business Model Innovation* and *Redistribution & Alternative Flows* remain modest in volume, their presence in *Research and Development* and *Implementation at Scale* sets OVS apart as a brand with emerging systemic intent. Adidas demonstrates the most comprehensive and operationalised CE profile. *Waste Reduction and Management* and *Sourcing & Inputs* are extensively embedded across all dimensions. The brand also shows solid integration of *Resource Efficiency*, with consistent reporting from *Strategy and Guidelines* to *Implementation at Scale*. Although *Business Model Innovation*, *Use-Phase Extension*, and *Recycling & Recovery* are less dominant in volume, their visibility across multiple dimensions signals a broader and more deliberate approach than seen in other brands.

In summary, while all five brands report on CE strategies, their implementation depth and dimensional balance vary significantly. Most brands favour upstream and production-related strategies, with strong alignment to existing operational structures. Downstream and innovation-driven strategies, such as redistribution, repair, and business model redesign, remain peripheral. Adidas and OVS stand out for their broader and more integrated approaches, while fast fashion brands show high reporting intensity with limited structural embedding. This suggests that CE ambition is most effectively translated into practice when it aligns with internal processes and measurement logic, a dynamic that continues to challenge transformative change.

4.2.3 Cross-Case Comparison by Brand Type

This section compares how different brand types, fast fashion, mass market, and innovation-driven, report on the implementation of circular economy (CE) strategies. The focus lies on which strategies are prioritised within each brand type and how consistently they are embedded across the five implementation dimensions. Table 8 provides a comparative overview of the main patterns observed per brand type. The underlying data are presented in the separate Excel file.

Fast fashion brands report most frequently on *Waste Reduction and Management*, followed by *Sourcing & Inputs* and *Resource Efficiency*. These strategies are primarily represented through *Strategy and*

Guidelines, with limited evidence of *Implementation at Scale* or *Research and Development*. While there is some breadth in strategic coverage, categories such as *Redistribution & Alternative Flows* are largely absent, and *Business Model Innovation* appears to be weak. Overall, this type emphasises visibility through reporting, but lacks structural follow-through, suggesting a CE narrative geared more toward positioning than transformation.

Mass market brands demonstrate a strong emphasis on *Waste Reduction and Management* and *Sourcing & Inputs*, with *Resource Efficiency* also receiving considerable attention. These strategies are better supported by *Quantitative Indicators* and *Targets* than in other types, indicating a more formalised reporting structure. However, *Implementation at Scale* and *Research and Development* remain underdeveloped, and *Redistribution & Alternative Flows*, although more prevalent than in fast fashion, still exhibit minimal strategic integration. This suggests operational maturity without profound transformation, with CE embedded into corporate routines rather than driving change.

Innovation-driven brands report more evenly across CE categories, with *Waste Reduction and Management*, *Sourcing & Inputs*, and *Resource Efficiency* taking the lead. Notably, implementation is more balanced across dimensions. While still low in absolute terms, *Implementation at Scale* and *Research and Development* are proportionally higher than in other types. *Business Model Innovation*, though modest, stands out as relatively stronger. Although these brands do not cover more strategies in total, they demonstrate greater consistency in embedding, with key strategies appearing across multiple dimensions. This suggests a more focused yet integrated approach to CE.

Brand type	Most reported strategies	Key strengths	Weaknesses	Overall profile
Fast fashion	Waste Reduction and Management; Sourcing & Inputs; Resource Efficiency	Breadth in Strategy and Guidelines; High in visibility	Low Implementation at Scale and R&D; Weak Business Model Innovation	Reporting-driven and symbolic; lacks follow-through
Mass market	Waste Reduction and Management; Sourcing & Inputs; Resource Efficiency	Quantitative Indicators and Targets; Structured reporting	Low Implementation at Scale and R&D; Minimal integration of Redistribution	Operationally mature but lack transformation
Innovation-driven	Waste Reduction and Management; Sourcing & Inputs; Resource Efficiency	More balanced across all dimensions; Higher R&D and scaling	Still modest absolute scores; Limited breadth in strategy coverage	Focused but integrated; Most consistent embedding

Table 8: Comparative overview of CE implementation characteristics by brand type

In summary, brand type significantly shapes the implementation structure of CE strategies. As established earlier, all brand categories consistently prioritise the same three strategy categories: *Waste Reduction and Management*, *Sourcing & Inputs*, and *Resource Efficiency*. The emphasis now shifts to how these strategies are embedded. Fast fashion brands exhibit discursive variety but lack depth, mass market brands formalise CE without embedding innovation, while innovation-driven brands adopt a narrower, yet more coherently implemented, CE agenda. Across all brand types, the highest levels of implementation occur in strategic and performance-oriented dimensions. At the same time, systemic integration and innovation remain weak, underscoring the ongoing challenge of transitioning CE from intention to transformation.

4.3 Synthesis and Discussion

This section synthesises the findings from the previous two sections to provide an integrated perspective on the implementation of circular economy (CE) strategies across the supply chains of European fashion and sportswear companies. It draws on both the strategic focus (RQ1) and implementation depth (RQ2) to highlight recurring patterns, tensions, and inconsistencies in how circularity is interpreted and operationalised. These insights are then discussed in light of the existing literature to identify theoretical implications and critical gaps in current practice.

The findings show that reported CE strategies are heavily concentrated in upstream and midstream supply chain stages, with a strong emphasis on sustainable sourcing, waste reduction, and resource efficiency. This reflects a preference for interventions that align with conventional production logic and can be easily quantified or certified (e.g., sustainable cotton, emissions reductions). Strategies central to a more transformative CE vision, such as use-phase extension, closed-loop recycling, or business model innovation, are far less frequently reported and, when present, are often described in vague or aspirational terms. These patterns reinforce earlier concerns in the literature that companies may selectively adopt CE language while avoiding more profound structural change (Korhonen et al., 2017; Jestratijevic et al., 2023). Notably, the analysis suggests that CE reporting often remains confined to high-level vision statements, target announcements, or fragmented performance indicators. Few companies demonstrate a consistent link between strategic intent and operational embedding. For instance, while several firms reference investment in innovation or pilot projects, these are rarely accompanied by evidence of scaling or integration into mainstream processes. This reinforces the idea that reporting practices, although increasingly standardised, may still be used as symbolic tools to manage stakeholder expectations rather than as mechanisms for accountability or transformation (Garcia-Torres et al., 2017).

As this study is based entirely on corporate reports, the findings reflect how companies choose to present their CE efforts to external stakeholders, rather than how these efforts are necessarily implemented in practice. When comparing different brand types, further nuances become apparent. Fast fashion companies, such as H&M and Inditex, report on a broad range of CE strategies but tend to concentrate them in upstream production stages, with limited references to systemic change. This aligns with previous claims that high-volume, trend-driven models are structurally misaligned with circularity principles (Dissanayake & Sinha, 2015; Niinimäki et al., 2020). Mass-market brands like Mango and OVS exhibit more consistent performance reporting but reveal little innovation or cross-functional integration, suggesting a risk-averse, compliance-driven approach (Todeschini et al., 2020). These patterns also resonate with earlier findings that mass-market firms often emphasise transparency metrics while deprioritising innovation-led transformation (Wong & Ngai, 2021). In contrast, the innovation-driven brand Adidas demonstrated broader supply chain engagement and more coherent reporting across implementation dimensions. However, even here, core CE strategies, such as business model transformation, remained underdeveloped.

Taken together, these patterns suggest that the maturity of CE implementation, as reflected in corporate reporting, remains uneven and often fragmented. Most companies focus on strategies that are institutionally supported, reputationally safe, or easy to monitor, while more disruptive or consumer-facing strategies remain peripheral. This supports critical perspectives in CE literature, which warn that without structural realignment of business models, CE risks becoming a “patchwork” of initiatives rather than a cohesive framework for change (Franco, 2017; Bocken et al., 2016). Nevertheless, the partial embedding of CE in areas such as sourcing and impact reduction indicates a foundation upon which more ambitious strategies could be built. If these are paired with innovation, long-term KPIs, and integration across departments, they may evolve from pilot-scale efforts to transformative levers. In this sense, the findings reinforce recent calls to integrate CE into core operational and reporting systems, not just as environmental add-ons but as strategic imperatives (Saha et al., 2024; DiVito & Bohnsack, 2017).

Interestingly, all three brand types emphasise the same three CE strategies: *Waste Reduction and Management*, *Sourcing & Inputs*, and *Resource Efficiency*. This suggests a shared strategic preference for initiatives that fit within existing operational and reporting frameworks (RQ1). However, the extent to which these strategies are embedded across implementation dimensions varies significantly (RQ2). Fast fashion brands demonstrate a broad discursive scope but limited operational depth. Mass market brands present more structured performance reporting but rarely go beyond incremental process optimisation. Innovation-driven brands, although not employing more strategies, exhibit more consistent embedding across dimensions, including scaling and R&D. This divergence suggests that convergence in strategic

content (RQ1) does not imply convergence in the depth of transformation or implementation (RQ2). These dynamics have important implications for the evolving role of sustainability reporting itself. As sustainability reporting becomes more regulated and subject to external assurance, the strategic function of reporting itself may evolve from symbolic expression to a driver of internal alignment.

Ultimately, this study highlights a central paradox: while the discourse of circularity is present and increasingly formalised in corporate reports, it is not yet matched by the depth of organisational change required to fulfil its promise. Bridging the gap between what is reported and what is operationalised remains a critical challenge, not only for individual companies but for the broader institutionalisation of circular economy principles across the fashion industry.

5 Conclusion and Recommendations

This final chapter reflects on the main findings of the study, drawing together insights from the strategic focus and implementation depth of circular economy (CE) strategies across five European fashion and sportswear brands. It discusses the broader implications for business practice, policy, and academic research, while also acknowledging the study's limitations and suggesting directions for future inquiry.

5.1 Conclusion

This study aimed to investigate how circular economy (CE) strategies are implemented across the supply chains of European fashion and sportswear companies, with a particular focus on strategic variety (RQ1) and the depth of implementation (RQ2).

The analysis reveals that while CE principles are widely referenced in corporate reports, their interpretation and application remain uneven across companies and brand types. Most firms focus on upstream and midstream strategies, such as sustainable sourcing, waste reduction, and resource efficiency, which align with operational routines and are easier to quantify and measure. By contrast, strategies with greater transformative potential, such as use-phase extension, closed-loop systems, or business model innovation, are peripheral and often symbolic. Interestingly, despite brand type differences, all types prioritise the same three CE categories. However, their embedding across implementation dimensions varies significantly. Fast fashion brands tend to report widely but demonstrate limited operational integration. Mass market brands formalise but avoid innovation, while innovation-driven brands embed fewer strategies more consistently. Implementation depth is similarly fragmented. While vision statements and targets are common, few companies demonstrate consistent

scaling, performance integration, or operational alignment. Reporting practices thus support selective engagement with CE, often reinforcing existing models rather than challenging them.

In summary, CE adoption in the fashion sector appears more influenced by how companies choose to report than by a structural shift in operations. Advancing CE will require not only new strategies but also a reconceptualisation of how business models, reporting systems, and innovation are aligned to enable systemic and scalable change.

5.2 Practical Implications

This study yields several actionable insights for fashion companies, policymakers, and supply chain actors seeking to advance the implementation of the circular economy (CE). A key priority is bridging the gap between strategic framing and operational execution.

For fashion and sportswear brands, this means moving beyond symbolic reporting toward internal alignment. Circular metrics should be embedded in product development, procurement, and performance systems. Especially in fast fashion and mass-market models, where CE efforts focus on low-disruption areas, this may require fundamental shifts in business logic.

To reflect different brand profiles, tailored strategies are needed. Fast fashion brands should incentivise CE through team metrics and shorter development loops. Mass-market firms can formalise CE integration via compliance and certification processes. Innovation-driven brands can leverage reporting as a reputational asset to scale more ambitious CE initiatives.

From a regulatory standpoint, frameworks such as the EU's CSRD can enhance transparency and comparability. However, without mechanisms to assess implementation depth, companies may continue to engage in selective reporting. Greater attention to assurance and standardisation is essential.

Beyond corporate boundaries, CE intersects with broader sustainability agendas. In line with SDGs 9 and 12, the adoption of robust CE can support inclusive value chains and innovation ecosystems. However, this requires connecting fragmented efforts across supply chain stages.

Ultimately, CE progress depends on integrative approaches that move beyond upstream siloes. Sector-wide collaboration, shared infrastructure, and traceability tools are essential for scaling CE from pilot projects to an embedded practice.

5.3 Theoretical Contributions

This study contributes to the circular economy (CE) by addressing several theoretical gaps in the context of the fashion industry. Unlike prior work that focuses on isolated CE strategies or single-brand cases, this research provides a comparative, multi-brand analysis structured around supply chain positioning and the depth of implementation.

First, it advances understanding of how CE strategies are distributed across supply chain stages. The findings confirm that circular efforts cluster in upstream and midstream processes. At the same time, downstream and cross-cutting stages remain underutilised, supporting earlier critiques of CE's production-centric bias and building on typologies such as Bocken et al.'s (2016) framework of narrowing, slowing, and closing loops. Second, the study introduces implementation depth as a layered analytical dimension. Rather than simply noting whether a strategy is present, it captures variation in anchoring, metrics, scaling, and innovation. This provides a more granular view of CE maturity, addressing the rhetorical–practical gap highlighted by authors such as Kirchherr et al. (2017) and Korhonen et al. (2017). Third, it positions sustainability reporting not only as a data source but also as a mechanism that shapes CE narratives. Reports serve to construct and legitimise CE practices, reflecting broader symbolic and strategic functions as discussed by Garcia-Torres et al. (2017).

Ultimately, this study raises questions about the feasibility of transformative CE strategies. Their limited presence may reflect not only organisational inertia, but also structural barriers such as cost constraints or institutional lock-ins.

Together, these contributions enhance the conceptualisation of circularity as a selective, context-dependent, and narratively mediated process. The findings provide an empirical elaboration of key conceptual models, demonstrating how CE ambitions are shaped, and often constrained, by reporting practices and business model dynamics.

5.4 Limitations and Future Research

This study, like any research, has limitations that offer opportunities for further inquiry. First, the analysis relies solely on publicly available corporate reports. While helpful in understanding how companies frame and communicate CE, these documents often reflect curated narratives and may overlook informal practices or unsuccessful initiatives. Future studies could enrich this perspective through interviews, internal documentation, or ethnographic research. Second, the sample focuses on five large, publicly listed European fashion and sportswear brands. This excludes smaller firms, informal actors, and global supply chain perspectives. Comparative research across geographies or firm sizes could offer greater

generalisability and reveal context-specific challenges. Third, the study emphasises environmental strategy and supply chain positioning. This leaves social aspects, such as labour, equity, and inclusiveness, underexplored. Future research could connect CE to broader sustainability frameworks, including the Sustainable Development Goals, to examine these intersections more holistically. Finally, the limited presence of transformative CE strategies (e.g., business model innovation, closed-loop systems) raises questions about their feasibility. Further work is needed to understand institutional, economic, and organisational conditions that enable or block deeper circular transitions.

These limitations point to the complexity of translating CE discourse into embedded, systemic change. Continued research is essential to understand how circular ambitions unfold in practice and how they vary across industrial, regulatory, and cultural contexts.

Use of AI-based Assistance

During the preparation of this thesis, artificial intelligence (AI) tools were used as supplementary support for writing, reviewing, and verifying the structure and consistency of the analysis. These tools helped refine academic phrasing, improve clarity, and ensure coherence across sections. Additionally, AI was used to verify whether the reported findings accurately reflected the underlying coded data and analytical framework. Grammarly was also used for additional spelling and grammar control. No content was generated autonomously by AI; all interpretations, arguments, and conclusions were critically reviewed and authored by the student. The use of AI adhered to the boundaries of academic integrity and ethical standards established by Ghent University.

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7 Appendices

Appendix A. Coding Framework and Descriptions of Circular Economy Strategies, Implementation Dimensions, and Supply Chain Stages

This appendix provides an overview of the coding framework used in NVivo for the qualitative content analysis of the corporate reports. It includes definitions of the circular economy strategies, implementation dimensions, and supply chain stages applied throughout the study.

Circular economy strategies	Description
Certified sources	Use of materials from certified sustainable sources (e.g., FSC, GOTS)
Donation	Giving used items to charity or community reuse platforms
Innovation	Implementation of new technologies or processes to support circularity
Longer use/durability	Extending product lifespan through design or quality improvement
Recycled materials	Use of materials that have previously been recycled
Recycling	Processes that recover materials or other for reuse in production
Chemical recycling	Advanced method converting waste into chemicals for reuse
Energy recycling	Capturing and reusing energy from industrial processes
Material recycling	Recovery of raw materials from waste streams
Upcycling	Transforming waste materials from waste streams
Water recycling	Purifying and reusing water within production processes
Redistribute	Reallocating unused products to other users or markets
Renewable energy	Use of energy from renewable source like solar or wind
Repair	Fixing or restoring products to extend their use
Resale (second life)	Selling used products again to give them a second life
Resource Efficiency	Minimising resource use per unit of output
Energy efficiency	Optimising energy input for production efficiency
Material efficiency	Optimising material input and reducing material loss
Water use efficiency	Reducing water consumption in production processes
Reuse	Using products or materials again for the same purpose
Sustainable sourcing	Choosing materials based on environmental criteria
Waste management	Systematic handling of waste including collection and sorting
Waste reduction	Minimising the total amount of waste generated

Chemical waste reduction	Reducing hazardous chemical output in waste streams
Energy waste reduction	Minimising waste resulting from energy use
GHG waste reduction	Lower emissions of greenhouse gases from waste processes
Material waste reduction	Reducing physical material loss during production or use
Water discharge reduction	Minimising harmful substances in discharged water
Implementation dimensions	Description
Implementation at scale	Applying the strategy beyond pilot projects or small-scale trials, integrated across the organisation or supply chain
Quantitative indicators	Use of measurable metrics to monitor progress, impact or performance related to CE objectives
Research and development	Investment or research in innovation, new materials, or processes that support circularity
Strategy and guidelines	Formalised organisational plan, principles, or internal policies guiding CE implementation
Targets	Defined goals or benchmarks for circularity, including timelines or numerical targets
Supply chain stages	Description
Auditing and certification	Verification or certification of environmental standards in the supply chain
Collaborations with other organizations	Partnerships with NGOs, research institutes, or industry peers to support circularity (no suppliers)
Customer use	The phase in which consumers wear, maintain, and dispose of garments
Ensuring transparency and traceability	Tracking materials and ensuring visibility of environmental practices
Packaging, distribution, and retail	Activities related to preparing, transporting, and selling garments to end-users
Post-consumer garment collection	Collecting used garments from consumers
Product design	Early-stage planning and design choices
Product manufacturing	The production process where materials are transformed into finished garments
Recycling fibres and materials	Processes that convert textile waste into reusable materials or fibres
Virgin raw material extraction and processing	Extraction and initial processing of non-renewable raw materials

Appendix B. Co-occurrence Matrices of Implementation Dimensions per Brand

Each matrix shows the percentage of fragments in the row category that were also coded with the column category. These data form the empirical basis for the brand-level implementation profiles discussed in Section 4.2.1.3.

Appendix B.1. Co-occurrence Matrix for Adidas

	Implementation at scale	Quantitative indicators	Research and development	Strategy and guidelines	Targets
Implementation at scale	100.0%	17.1%	17.1%	85.7%	8.6%
Quantitative indicators	10.5%	100.0%	7.0%	82.5%	54.4%
Research and development	27.3%	18.2%	100.0%	72.7%	22.7%
Strategy and guidelines	24.0%	37.6%	12.8%	100.0%	33.6%
Targets	6.3%	64.6%	10.4%	87.5%	100.0%

Appendix B.2. Co-occurrence Matrix for H&M

	Implementation at scale	Quantitative indicators	Research and development	Strategy and guidelines	Targets
Implementation at scale	100.0%	31.3%	6.3%	43.8%	12.5%
Quantitative indicators	11.9%	100.0%	0.0%	31.0%	52.4%
Research and development	7.7%	0.0%	100.0%	61.5%	0.0%
Strategy and guidelines	5.9%	11.0%	6.8%	100.0%	8.5%
Targets	6.9%	75.9%	0.0%	34.5%	100.0%

Appendix B.3. Co-occurrence Matrix for Inditex

	Implementation at scale	Quantitative indicators	Research and development	Strategy and guidelines	Targets
Implementation at scale	100.0%	26.1%	7.2%	50.7%	14.5%
Quantitative indicators	78.3%	100.0%	4.3%	13.0%	4.3%
Research and development	50.0%	10.0%	100.0%	50.0%	0.0%
Strategy and guidelines	27.3%	2.3%	3.9%	100.0%	24.2%
Targets	23.8%	26.2%	0.0%	73.8%	100.0%

Appendix B.4. Co-occurrence Matrix for Mango

	Implementation at scale	Quantitative indicators	Research and development	Strategy and guidelines	Targets
Implementation at scale	100.0%	26.7%	10.0%	83.3%	23.3%
Quantitative indicators	10.1%	100.0%	34.2%	78.5%	26.6%
Research and development	4.5%	40.9%	100.0%	65.2%	19.7%
Strategy and guidelines	9.7%	24.0%	16.7%	100.0%	28.3%
Targets	8.5%	25.6%	15.9%	89.0%	100.0%

Appendix B.5. Co-occurrence Matrix for OVS

	Implementation at scale	Quantitative indicators	Research and development	Strategy and guidelines	Targets
Implementation at scale	100.0%	40.0%	4.0%	34.0%	12.0%
Quantitative indicators	45.5%	100.0%	0.0%	29.5%	25.0%
Research and development	22.2%	0.0%	100.0%	11.1%	11.1%
Strategy and guidelines	24.6%	18.8%	1.4%	100.0%	11.6%
Targets	27.3%	50.0%	4.5%	36.4%	100.0%