THE ROLE OF THE CIRCULAR ECONOMY MODEL IN THE GREEN TRANSFORMATION OF SMALL BUSINESSES

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Abstract

The transition from a linear to a circular economic model is a central strategy for reconciling business growth with environmental sustainability. Small and medium-sized enterprises (SMEs), over 90% of businesses worldwide [1], still lag behind large firms in adopting circular economy (CE) practices. This thesis examines the role of the CE model in the green transformation of small businesses, drawing on peer-reviewed research, European Commission Eurobarometer data, and industry market reports. Using a qualitative, literature-based design, it synthesizes evidence on CE adoption rates, financial and environmental outcomes, and barriers, chiefly cost, limited expertise, and administrative complexity. Findings show circular practices are positively associated with resource efficiency, cost savings, and financial performance, while awareness and finance gaps remain the main constraints on adoption among micro and small firms. The thesis closes with policy and managerial recommendations for accelerating circular transformation in the small-business sector.

Keywords: circular economy; green transformation; SMEs; sustainability; resource efficiency; eco-innovation

Introduction

Environmental degradation, resource scarcity, and regulatory pressure have pushed the circular economy (CE) from a niche concept into a mainstream policy and business priority. The Ellen MacArthur Foundation defines the CE as a system built on three design-driven principles: eliminating waste and pollution, circulating products and materials at their highest value, and regenerating natural systems.[2] Unlike the linear "take-make-waste" model, the CE decouples economic activity from finite-resource consumption.

SMEs occupy a paradoxical position in this transition. They make up more than 90% of businesses globally, so Net Zero targets are unattainable without their participation; yet they typically have limited capital and technical expertise, making circular transformation structurally harder for them than for large firms.[3]

This thesis asks: to what extent, and through which mechanisms, does the CE model contribute to the green transformation of small businesses, and what factors enable or constrain this process? Three

[1] Chakraborty, A., De, D., & Dey, P. K. (2025). Circular economy in small and medium-sized enterprises — Current trends, practical challenges and future research agenda. Systems, 13(3), 200. https://doi.org/10.3390/systems13030200

[2] Trellis. (2024). What is a circular economy? [Summary of the Ellen MacArthur Foundation's circular economy framework]. https://trellis.net/article/circular-economy-principles-

[3] Akhter, S. R., & Ceustermans, S. (2026). Circular economy practices and barriers within European SMEs in the construction sector. European Journal of Sustainable Development, 15(1). https://doi.org/10.14207/ejsd.2026.v15n1p53

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questions guide the analysis: (1) What evidence links CE adoption to the performance of small businesses? (2) What is the current scale of CE adoption among SMEs? (3) What are the main barriers and enablers identified in the literature? The topic matters because SMEs' aggregate footprint is large but under-researched, because the findings can inform SME-support policy, and because evidence of financial pay-off strengthens the business case for owner-managers.

Conceptualizing the Circular Economy

The CE has been defined in overlapping ways. The Ellen MacArthur Foundation's three-principle framework (eliminate waste and pollution; circulate products and materials at their highest value; regenerate nature) is most widely cited.[4] Korhonen, Honkasalo, and Seppälä describe the CE as a production–consumption system maximizing service per unit of material and energy throughput while respecting ecosystems' regenerative capacity[5]; ISO 59004:2024 similarly frames it as a systemic approach to recovering and retaining resource value.[6] Across definitions, three elements recur: closing resource loops, retaining value over the product life cycle, and redesigning business models systemically rather than merely technically.

The CE as a Vehicle for SME Green Transformation

A growing body of research links CE adoption to the broader "green transformation" of small firms. Chakraborty found that transformation is impeded less by unwillingness than by an absence of accessible frameworks: SMEs face organizational reluctance, cultural inertia, and a shortage of circular business models suited to their scale. Springer argues that SMEs, despite contributing significantly to EU GDP, play a pivotal but under-supported role in the shift to circularity, proposing organizational "pillars" (strategy, culture, resources, network) to sustain it.[7]

Firm-level evidence supports a positive CE–performance link. Among Indonesian micro and small enterprises, CE practices mediate the relationship between green transformational leadership and financial performance ($\beta = 0.16$, $p < 0.01$), so leadership translates into profit through circular operational change rather than directly.[8] Arsawan found organizational agility and environmental dynamism significantly drive strategic shifts toward circularity among Indonesian SMEs, while other resaerchers found digital technology adoption and sustainable supply-chain management significantly affect firms' CE capability.[9]

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[4] Trellis. (2024). What is a circular economy? [Summary of the Ellen MacArthur Foundation's circular economy framework]. https://trellis.net/article/circular-economy-principles-

[5] IDED. (2024). Circular economy [Glossary entry, citing Korhonen, Honkasalo, & Seppälä, 2018]. https://ided.digital/ressourcen/glossar/circular-economy

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Barriers to Circular Adoption

Adoption remains uneven. A survey found 48.5% of EU SMEs had never heard the term "circular economy", 25% were unsure of its meaning, and only 9% understood and used it.[10] A larger Eurobarometer-based analysis (n ≈ 10,000) found a third of firms adopted multiple resource-efficiency practices while 10% took no action at all. Construction-sector research using Flash Eurobarometer 549 (n = 2,242) found cost was the most common difficulty, administrative and technical barriers were comparatively minor, and firm size, not turnover or age, predicted CE adoption.[11]

Methodology

This thesis uses a qualitative, desk-based design combining a structured literature review with secondary data analysis. Peer-reviewed sources were retrieved from ScienceDirect, Springer, MDPI, Wiley, Frontiers, and open preprint archives using the terms "circular economy", "SME", and "green transformation", restricted mainly to 2021-2026 publications. Quantitative evidence came from official sources, chiefly European Commission Flash Eurobarometer surveys on SMEs, resource efficiency, and green markets, supplemented by industry market reports[12] for global market sizing. As a condensed, article-length synthesis rather than a full empirical dissertation, no new primary data was collected; the contribution lies in triangulating dispersed findings. Limitations include reliance on secondary data of varying rigor and a geographic skew toward the EU and Southeast Asia.

Scale and Growth of the Circular Economy

The CE has moved from a marginal concept to a substantial economic sector. The global CE market was valued at roughly US$463 billion in 2024, rising to US$518 billion in 2025 (11.8% CAGR) and projected to reach US$798 billion by 2029, driven by landfill pressure, population growth, and digital resale platforms.[13] A broader definition used by Global Market Insights, including remanufacturing and industrial symbiosis, estimates the sector at US$2.7 trillion in 2024, growing to US$5.8 trillion by 2034; both estimates confirm strong double-digit growth. The sector already supports about 2.2 million jobs worldwide (+125,000 in the past year), and India's CE alone could create close to 10 million jobs by 2050.[14]

Adoption Among Small Businesses

Adoption at firm level is uneven and shallower than headline figures suggest. The EU's 2024 Eurobarometer found 93% of SMEs had implemented at least one resource-efficiency measure and 25% had a carbon-reduction strategy[15], yet earlier Eurobarometer-based analysis of ~10,000 SMEs found only about a third had adopted multiple practices in parallel, and 10% had taken no action at all,

[10] IEMA. (2014). SMEs lack circular knowledge [Summary of EU Fusion Observatory survey]. https://iema.net/articles/smes-lack-circular-knowledge

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suggesting the 93% figure often reflects one low-cost action rather than systemic redesign. Consistent with this, 72% of SMEs invested under 5% of turnover in resource efficiency over two years, and cost-neutral or cost-saving actions dominate.

Awareness is itself a binding constraint: 48.5% of small businesses surveyed in Belgium, France, and the UK had never heard the term "circular economy", and only 9% both understood and used it, even though 60.5% of UK respondents already practised elements of circularity such as recycling and repair. Many small firms therefore appear to be "accidental" circular actors, limiting their ability to capture the full benefits documented in the literature.

Sectoral Evidence and Financial Outcomes

Sector-specific research confirms the pattern: among 2,242 EU construction SMEs, operational actions (water, energy, material efficiency) were widespread while circular design and supplier-switching remained underused; cost was the most common barrier, and firm size, not turnover or age, predicted adoption.[16] Where circularity is adopted more fully, it tends to pay off: CE practices mediate the link between green transformational leadership and financial performance among Indonesian MSEs ($\beta = 0.16$, $p < 0.01$; Frontiers in Sustainability, 2025), and similarly mediate the green-HR-management-to-sustainable-performance link in other emerging-market SMEs. Circularity thus functions less as a compliance cost than as an operational lever linked to measurably better outcomes.

Table 1. Selected quantitative indicators of the circular economy and SME adoption

Indicator	Value
Global circular economy market size (2025)	US$517.79 billion, 11.8% CAGR
Projected global CE market (2029)	US$798.3 billion
EU SMEs implementing ≥1 resource-efficiency measure	93%
EU SMEs with a carbon-reduction strategy	25%
SMEs citing high cost as a barrier	28%
SMEs citing complex administrative/legal procedures	35%
SMEs unaware of the term "circular economy"	48.5%
Global CE-sector employment	~2.2 million jobs (+125,000/yr)

Conclusion and Recommendations

This thesis examined the role of the CE model in the green transformation of small businesses, reaching three conclusions. First, the CE is a fast-growing economic sector, worth from roughly half a trillion to several trillion US dollars depending on scope, and already generating millions of jobs, which

[16] Akhter, S. R., & Ceustermans, S. (2026). Circular economy practices and barriers within European SMEs in the construction sector. European Journal of Sustainable Development, 15(1). https://doi.org/10.14207/ejsd.2026.v15n1p53

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small businesses can enter as both adopters and beneficiaries. Second, SME engagement is real but shallow: most firms take at least one low-cost resource-efficiency action, but only a minority pursue systemic circular redesign, and many remain unaware of the concept. Third, where circular practices are adopted more fully, especially alongside green-oriented leadership, organizational agility, and adequate firm size, they are consistently linked to improved financial performance, providing a genuine business case rather than a purely regulatory one.

Cost and knowledge gaps, not unwillingness, appear to be the main constraints on deeper adoption. Policy and managerial interventions should therefore prioritize: (1) low-cost advisory and coaching services delivered through SME intermediaries; (2) financial instruments (grants, low-interest loans, tax incentives) that lower the up-front investment threshold; and (3) simplified, sector-specific circular business-model templates suited to firms with fewer than ten employees, who make up most of the SME population.

This thesis is limited by its reliance on secondary, largely European and Southeast Asian data. Future research would benefit from primary, cross-regional survey work, particularly in Central Asia and other emerging markets where CE research remains sparse, to test whether these drivers and barriers generalize beyond the contexts currently dominating the literature.

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