

## Circular Economy and Sustainable Procurement: A Content Analysis in the Turkish Logistics Sector

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### ABSTRACT

**Purpose:** This study aims to examine the integration of circular economy principles into the procurement processes of Türkiye's leading logistics companies. It seeks to identify how sustainable procurement strategies reflect circular economy practices within the logistics sector and to reveal the thematic emphasis of firms' sustainability reporting.

**Methodology:** The study applies a qualitative content analysis method using the MAXQDA software to analyze the sustainability and activity reports of eight major logistics firms listed in the 2024 Fortune Türkiye ranking. Five main themes and ten sub-themes were established to evaluate the presence and frequency of circular economy-related practices.

**Findings:** The results reveal that the themes of Sustainable Procurement and Material Selection, and Energy and Resource Efficiency are the most emphasized areas among Türkiye's largest logistics companies. While practices related to recycling and waste management are widely adopted, limited emphasis is observed on repair, maintenance, and green procurement sub-themes. The findings demonstrate a growing awareness of circular procurement practices and the alignment of sustainability objectives with operational strategies.

**Originality:** This study presents a comprehensive thematic content analysis focusing on the intersection of circular economy and sustainable procurement within Türkiye's logistics sector. It provides evidence-based insights into how leading logistics firms integrate circular principles into procurement and supply chain processes, contributing to the literature on sustainable logistics and circular supply chain management.

**Keywords:** Circular Economy, Sustainable Procurement, Supply Chain Management, Logistics, Content Analysis.

**JEL Codes:** Q56, L91, M11, Q01.

## Döngüsel Ekonomi ve Sürdürülebilir Tedarik: Türkiye Lojistik Sektöründe Bir İçerik Analizi

### ÖZET

**Amaç:** Bu çalışma, Türkiye'nin önde gelen lojistik firmalarının tedarik süreçlerine döngüsel ekonomi ilkelerinin entegrasyonunu incelemeyi amaçlamaktadır. Araştırma, sürdürülebilir tedarik stratejilerinin döngüsel ekonomi uygulamalarını nasıl yansıttığını ortaya koymakta ve firmaların sürdürülebilirlik raporlarındaki tematik vurguları belirlemeyi hedeflemektedir.

**Yöntem:** Çalışmada 2024 Fortune Türkiye listesinde yer alan sekiz büyük lojistik firmasının sürdürülebilirlik ve faaliyet raporları, MAXQDA yazılımı kullanılarak nitel içerik analizi yöntemiyle incelenmiştir. Analiz kapsamında beş ana tema ve on altı tema belirlenerek döngüsel ekonomi uygulamalarının varlığı ve kodlama sıklığı değerlendirilmiştir.

**Bulgular:** Bulgular, Türkiye'nin en büyük lojistik firmaları arasında Sürdürülebilir Tedarik ve Malzeme Seçimi ile Enerji ve Kaynak Verimliliği temalarının en çok vurgulanan alanlar olduğunu göstermektedir. Geri dönüşüm ve atık yönetimi uygulamaları yaygın olarak benimsenirken, onarım, bakım ve yeşil tedarik alt temalarına sınırlı düzeyde vurgu yapılmıştır. Bulgular, döngüsel tedarik uygulamalarına yönelik artan farkındalığı ve sürdürülebilirlik hedeflerinin operasyonel stratejilerle uyumunu ortaya koymaktadır.

**Özgünlük:** Bu çalışma, Türkiye lojistik sektöründe döngüsel ekonomi ile sürdürülebilir tedarik kesişimini ele alankapsamlı bir tematik içerik analizidir. Lojistik sektöründeki öncü firmaların tedarik ve tedarik zinciri süreçlerine döngüsel ilkeleri nasıl entegre ettiğine dair kanıta dayalı bulgular sunarak, sürdürülebilir lojistik ve döngüsel tedarik zinciri yönetimi literatürüne katkı sağlamaktadır.

**Anahtar Kelimeler:** Döngüsel Ekonomi, Sürdürülebilir Tedarik, Tedarik Zinciri Yönetimi, Lojistik, İçerik Analizi.

**JEL Kodları:** Q56, L91, M11, Q01.

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## 1. INTRODUCTION

In response to the limitations of the traditional linear economic model, the concept of the circular economy has gained increasing attention in recent years. In a linear economic system, resources are extracted, utilized, and subsequently discarded as waste; this process leads to resource depletion and substantial waste generation. In contrast, the circular economy model aims to minimize waste and maximize resource efficiency through practices such as reuse, recycling, and consumption reduction. This model not only seeks to reduce environmental impacts but also promotes long-term sustainable value creation for businesses and society. When circular economy principles are applied to procurement processes, they enable the transformation of conventional procurement approaches, prioritizing sustainability and resource efficiency. Circular procurement strategies are based on sustainable resource use, recycling practices, and waste minimization, thereby targeting the reduction of environmental harm and cost savings in the long term. Given the critical role of procurement processes within organizational operations, integrating circular economy principles into procurement strategies contributes to aligning with broader corporate sustainability goals.

The literature contains numerous studies on circular economy and sustainable procurement strategies, highlighting the importance of collaboration in supply chains, performance measurement, technology adoption, cultural transformation, and environmental sustainability practices. For instance, Altuntaş and Türker (2012) examined sustainable development as a balance between economy, society, and environment and analyzed how sustainable supply chains are implemented at strategic and institutional levels in Türkiye. They conducted a content analysis of sustainability reports from 10 manufacturing firms in Türkiye based on Seuring and Müller's (2008) theoretical model, producing conceptual mappings that revealed firms' perceptions of sustainable supply chain management and supplier policies. Their findings indicate that sustainable supply chain practices are evolving in Türkiye. Witjes and Lozano (2016) explored the relationship between sustainable public procurement and the circular economy, advocating for a shift from traditional product-focused procurement to service-oriented and collaborative models. Their proposed framework emphasized enhancing resource efficiency and waste reduction by considering technical, social, and cultural factors. They underscored that collaboration strengthens buyer-supplier relationships and supports the development of sustainable business models, noting the critical role of public-private partnerships in advancing the circular economy. Stewart and Niero (2017) analyzed sustainability reports from 46 companies in the fast-moving consumer goods sector to understand the adoption of circular economy principles. They found that companies mostly focused on product and packaging-related activities, while consumer engagement and business model innovations remained limited. The link between the circular economy and sustainability was often implicit, with quantitative assessments being rare. The authors stressed the need for further research on the systemic aspects of the circular economy. Senir and Büyükkelik (2017) assessed the environmental performance of six logistics companies listed in the 2015 Fortune 500 and publishing sustainability reports using the TOPSIS method. Criteria included energy consumption, water use, greenhouse gas emissions, and waste volumes. Borusan achieved the highest environmental performance score (0.801), while Netlog scored the lowest. The study highlighted the limited number of firms publishing sustainability reports and called for enhanced sustainability strategies to improve environmental performance across the sector. Pollice and Batocchio (2018) examined the evolving role of procurement and supply chain management within the circular economy framework. They argued that the traditional "take-make-dispose" approach is inadequate and that procurement processes must align with circular principles. Their case study in a global consumer goods company analyzed the transition to a circular procurement approach, emphasizing the importance of procurement maturity, stakeholder collaboration, and circular performance measurement systems for success. De Angelis et al. (2018) investigated the integration of circular economy principles into supply chain management, conceptualizing "circular supply chains." Through a literature review, they defined traditional, sustainable, and circular supply chains, proposing five key recommendations: shifting from product ownership to leasing and access, the significance of flexible structures, managing technical and biological cycles, cross-sector collaboration, and the role of public-private procurement. The study noted a lack of practical examples for implementing circular supply chains and identified financing and energy resources as major barriers to sustainable circular models. Akbal (2022) addressed the concept of sustainable logistics by examining green logistics practices aimed at reducing the environmental impacts of logistics activities. Using a literature review approach, the study defined practices such as green procurement, green packaging, green distribution, green production, and reverse logistics, emphasizing their environmental, economic, and social benefits. It was noted that environmental awareness provides firms with competitive advantages, and recommendations included personnel training, carbon footprint reduction, and eco-friendly transportation methods for sustainable logistics. Mirzaei and Shokouhyar (2022) explored sustainable supply chain practices in the mobile industry and their connection to the circular economy. Through thematic analysis of social media content, they found that customers particularly value environmental sustainability issues. Circular economy supports both economic and environmental aspects of sustainability, with mobile

companies leveraging this approach to improve their sustainability performance. Dey et al. (2020) demonstrated the importance of the circular economy in enhancing sustainability in small and medium-sized enterprises (SMEs). Environmental and social performance were linked to production and usage phases, while other phases contributed mainly to economic performance. The study highlighted the need for SMEs to develop strategies, resources, and competencies to adopt the circular economy. Sanches et al. (2022) investigated how companies adopt sustainable circular economy strategies, identifying 50 strategies grouped into nine categories. They analyzed sustainability reports from 17 multinational companies in Brazil, showing significant focus on these strategies. However, improvements were needed in business models and products. The study proposed a new framework illustrating how these strategies integrate into company processes and suggested future research on digitalization strategies and reporting continuity. Güngör (2023) analyzed sustainability reports of companies listed on Borsa Istanbul to examine circular economy adoption. The results indicated that companies primarily addressed the circular economy within environmental sustainability, focusing on recycling and waste recovery practices, while renewable energy and socio-economic dimensions required further development. The study revealed that circular economy practices are still emerging in Türkiye. Akan Özkök (2024) systematically reviewed academic publications and reports on sustainable supply chain management and circular business models. The research established the theoretical framework of circular models and analyzed their environmental and economic benefits to firms. Findings demonstrated the critical role of circular models in sustainable supply chain management. Rosário et al. (2024) examined the role of the circular economy and sustainability in business development by systematically analyzing 97 articles from the SCOPUS database. The analysis confirmed the interconnection between the circular economy and sustainability concepts. Firms were advised to adopt circular business models, enhance resource efficiency, and utilize new technologies to improve competitiveness, while overcoming cost, technological, and cultural barriers. Future research directions included IoT, artificial intelligence, and blockchain technologies. Popa et al. (2025) showed that circular economy practices and procurement strategies positively influence organizational competitiveness. Access to resources, innovation, and organizational culture were identified as key factors strengthening this effect. The study emphasized the strategic role of procurement in the relationship between sustainability and competitiveness.

Although many studies exist on circular economy and sustainable procurement strategies, research specifically examining the integration of these concepts through sustainability reports of major logistics firms in Türkiye remains limited. This study focuses on the integration of circular economy principles into procurement processes, particularly within the context of sustainable procurement strategies. The objective is to analyze how circular economy applications are reflected in procurement processes and to reveal current practices. As part of the research, sustainability or activity reports of eight of Türkiye's largest fifteen logistics companies listed in the 2024 Fortune Türkiye list will be examined in detail using the MAXQDA content analysis software. Thus, the study aims to make a unique contribution to the literature on circular economy integration through the sustainability practices of Türkiye's leading logistics firms. Accordingly, the study seeks to answer the following questions:

1. What is the current status of circular economy applications in Türkiye's logistics sector?
2. How are sustainable procurement strategies shaped in practice?
3. How do Türkiye's largest logistics companies reflect circular economy principles in their procurement processes within sustainability reports?
4. Which circular economy applications are prioritized in these firms' sustainable procurement strategies?

This study consists of an introduction and two main chapters. The introduction addresses the literature and conceptual framework, explaining sustainable economy and sustainable procurement strategies and their significance. The second chapter focuses on the research methodology, detailing the purpose, method, and data set, followed by the analysis and findings. The final chapter presents the conclusions and recommendations.

The research findings indicate that the largest logistics firms operating in Türkiye and listed in the Fortune 500 provide meaningful information on sustainable economic models and procurement strategies within their activity reports.

### 1.1. Circular Economy Model and Its Principles

The circular economy concept has gained significant attention, particularly within the European Union's Horizon 2020 strategy. Its core focus is on the restorative use of resources, aiming to prevent raw materials from turning into waste. Although other concepts related to the circular economy exist, they often overlap, confusing. The circular economy aims to minimize waste and optimize resource efficiency. While various related concepts, such as the blue economy and cradle-to-grave, share similar goals, they differ in characteristics (Geisendorf and Pietrulla, 2018).

The Ellen MacArthur Foundation defines the circular economy as a system in which materials are never considered waste and the environment is continuously regenerated. In this model, products and materials are kept in circulation through various practices such as maintenance, reuse, refurbishment, remanufacturing, recycling, and composting. The circular economy addresses global issues like climate change, biodiversity loss, waste, and pollution by separating economic growth from the consumption of limited natural resources (The Ellen MacArthur Foundation, 2024). According to the UNDP, the circular economy presents an alternative to the traditional "linear economy," which involves extracting resources, transforming them into products, and discarding them as waste. Currently, only 7.2% of materials are recycled back into the economy. This linear model contributes to environmental challenges such as climate change, biodiversity loss, and pollution. In contrast, the circular economy focuses on minimizing waste and encouraging sustainable use of resources through strategies like innovative product design, longer product life, and recycling. This approach not only helps reduce pollution but also plays a vital role in addressing other global issues such as climate change and the loss of biodiversity (UNDP, 2023).

The circular economy is one of the most popular and influential concepts in sustainability. It promises to balance economic activities with the ecological system, which has limited resources, by integrating aspects of both systems (Figge et al., 2023). The circular economy model is based on three key principles: eliminating waste and pollution, circulating products and materials, and regenerating nature. These principles aim to create a more sustainable and restorative economic system (Rowan and Rowan, 2024).

**Eliminating Waste and Pollution:** This concept focuses on minimizing waste and pollution by adopting circular economy practices, such as recycling and resource recovery. By reusing organic waste, particularly through composting, harmful environmental impacts such as nutrient leakage and eutrophication can be mitigated. Composting not only helps in waste management but also supports sustainable agricultural practices by replenishing soil nutrients and reducing reliance on chemical fertilizers. Ultimately, integrating recycling and composting within production systems reduces pollution and promotes a more sustainable, closed-loop economy (Bekchanov, and Mirzabaev, 2018).

**Circulating Products and Materials:** In a circular economy, materials flow through two distinct cycles—the bio-cycle and the techno-cycle—where minimizing processing steps for reuse helps maintain higher material quality. (Türkiye Circular Economy Platform, 2020).

A detailed diagram of the topic "Circulating Products and Materials" can be found in Figure 2 below.

**Regenerating Nature:** Regenerating nature involves not just repairing ecosystems but enhancing them, aiming for long-term improvement and self-sufficiency. The goal is to restore ecological health, increase biodiversity, and ensure the sustainability of natural systems, creating environments that can better support life and provide resources. Unlike restoration, which focuses on returning ecosystems to their previous state, regeneration aims to create more resilient and thriving systems for the future (Morsetto, 2020).

A study by the EEA presents a simplified model of the circular economy (Figure 1). The model aims to minimize waste generation and material inputs through eco-design, recycling, and reuse, thereby achieving both economic and environmental benefits (Veral, 2019).

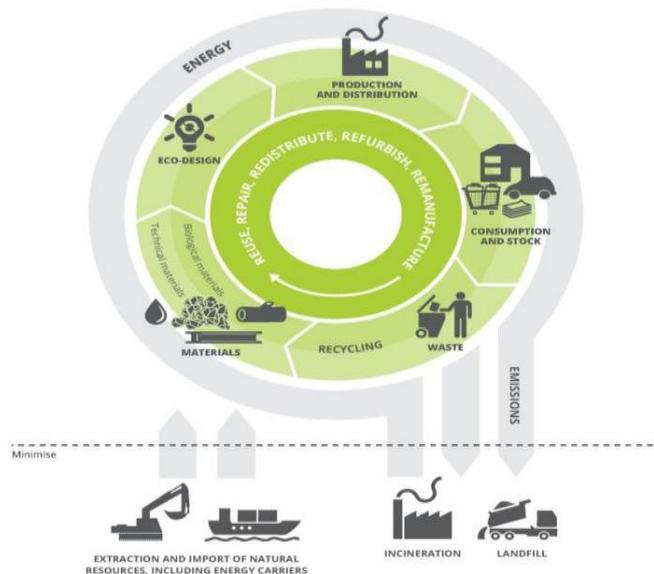


Figure 1. Circular economy model (EEA, 2016)

Figure 2 illustrates the circular economy's butterfly diagram, highlighting the continuous flow of materials through two key cycles: the biological and technical cycles. The biological cycle addresses biodegradable materials, such as food, which return to the Earth to regenerate nature. On the other hand, the technical cycle focuses on products that are used rather than consumed, ensuring that materials remain in circulation through processes like reuse, repair, remanufacture, and recycling. This diagram emphasizes the importance of maintaining materials within the technical cycle as long as possible to prevent them from becoming waste (The Ellen MacArthur Foundation, 2024).

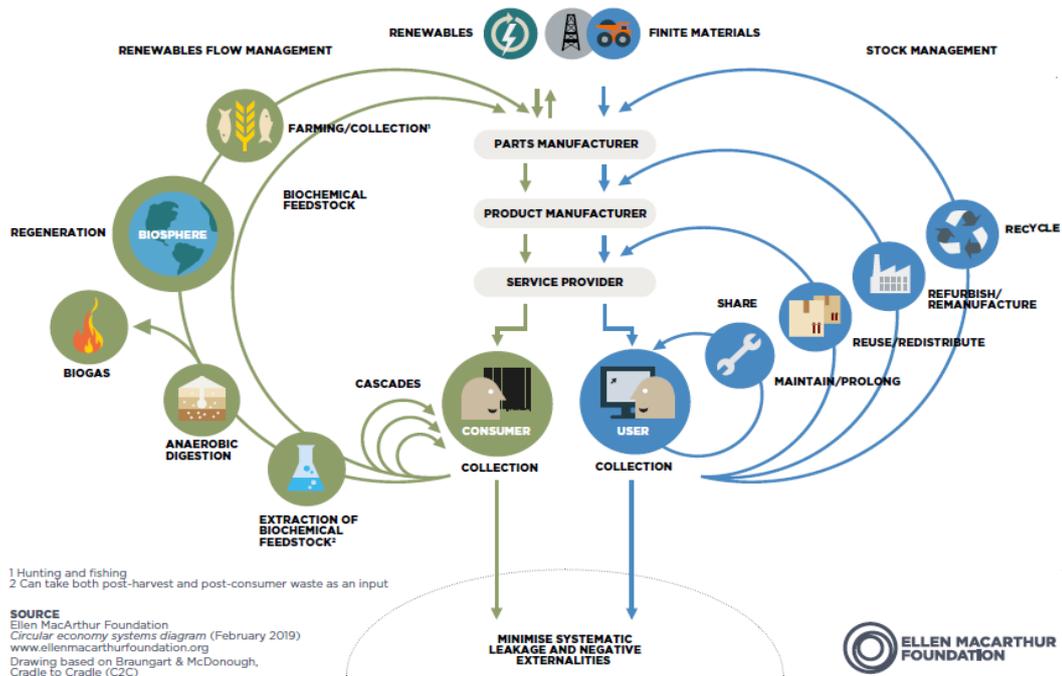


Figure 2. Circular economy butterfly diagram (The Ellen MacArthur Foundation, 2024)

## 1.2. Circular Procurement and Circular Procurement Strategies

Circular procurement integrates circular economy principles into purchasing by prioritizing resource efficiency, waste reduction, and sustainability. Unlike traditional linear procurement, which follows a model of resource extraction, production, and disposal, circular procurement focuses on extending product life cycles through recycling, reuse, and durability. It helps close material loops, reduces reliance on virgin raw materials, and lowers carbon emissions, making it vital for sustainable supply chain management (Sajid et al., 2024). According to the European Commission, circular public procurement involves acquiring goods, services, or works that contribute to closed energy and material loops while minimizing environmental impacts and waste during their lifecycle (European Commission, 2017).

Two main strategies support circular procurement: purchasing circular products by including criteria like resource efficiency, reparability, and recycled content in tenders; and promoting innovative business models, such as shifting from ownership to service access (Al-Sinan et al., 2022). The United Nations Environment Program highlights key criteria, including resource efficiency and product reparability, alongside lifecycle extension practices like reuse, repair, remanufacturing, and recycling. Business models like Product-Service Systems and supplier take-back promote resource efficiency and reduce demand for new products, while sharing platforms optimize asset use. Enablers include consumer information, lifecycle costing, partnerships, and legal-fiscal support to address potentially higher upfront costs.

Circular procurement requires a shift from transactional, technical-specification-based purchasing to collaborative, function-driven processes focused on long-term buyer-supplier relationships, product longevity, and lifecycle cost optimization (Van Oppen et al., 2018 page 32.). It emphasizes services over ownership—renting or leasing encourages manufacturers to design durable, maintainable products—and designs products for reuse and recyclability to support buy-back, resale, or service models. Market dialogue fosters transparency and collaboration among suppliers, recyclers, and stakeholders for an efficient circular system (CIPS, 2025). Businesses are central to the transition, embedding circular economy principles in strategy, training, and processes. The core principles are reducing waste and pollution, maximizing product and material value, and regenerating natural systems. Companies advance this through circular innovation,

supply chain practices, and procurement frameworks adapted by sector and region (The Ellen MacArthur Foundation, 2021).

Circular procurement balances value for money with sustainability, contrasting with traditional procurement's focus on cost and quality. Public procurement drives closed-loop supply chains, while private procurement follows similar principles under different regulations. Successful implementation depends on developing a circular economy strategy, securing top-management support, and equipping procurement staff with necessary skills (Bak, 2020: 14).

## 2. METHODOLOGY

### 2.1. Research Purpose and Method

The purpose of this study is to examine the integration of circular economy practices into supply chain processes through the sustainability reports of Türkiye's leading logistics companies. Within the scope of the research, the reports of eight logistics firms that published sustainability or activity reports were analyzed using content analysis with the MAXQDA software. These firms were selected from the top 14 logistics companies listed in the 2024 Fortune 500 Türkiye ranking.

Content analysis is a research method that allows for the systematic, objective, and quantifiable examination of texts, documents, and records. It originated in the 16th century with the analysis of religious discourse in newspapers and has since evolved with the support of computer-assisted applications. Today, it is widely used in various fields such as communication, sociology, and psychology. This method enables researchers to uncover both explicit and implicit meanings within texts. Categorizing data neutrally and systematically produces reliable results. Content analysis helps to better understand and interpret social reality (Metin and Ünal, 2022).

In this study, content analysis was chosen to objectively and systematically investigate how circular economy practices are reflected in the supply chain processes within the sustainability reports of major Turkish logistics companies. The research identified five main themes and, under each, two sub-themes forming the basis of the content analysis. These main and sub-themes are presented in Table 1.

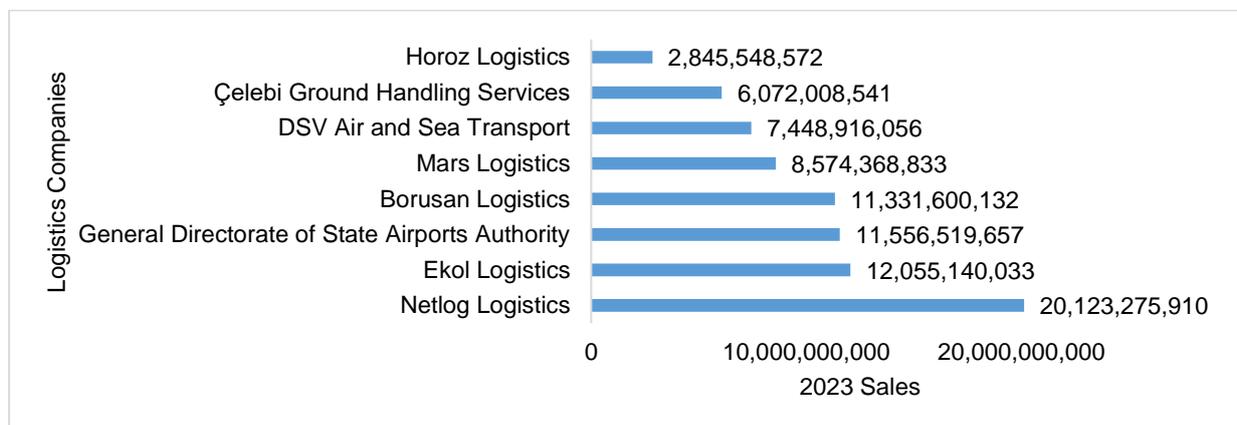
**Table 1. Thematic coding**

| Main Theme  | Sub-Themes                                |
|---|---|
| Recycling and Waste Management                      | Recycling\Waste Management                |
| Sustainable Procurement and Material Selection      | Sustainable Procurement\Green Procurement |
| Circular Processes and Product Lifecycle Management | Repair\Maintenance                        |
| Energy and Resource Efficiency                      | Energy Saving\Carbon Footprint            |
| Strategic Alignment and Integration                 | Circular Economy\Sustainability           |

Source: Created by the authors

### 2.2. Data Set of the Study

The data set of this study was created based on the top 14 logistics companies listed in the 2024 Fortune 500 Türkiye ranking. Among these companies, 8 firms that published sustainability or activity reports were included in the content analysis. The firms included in the analysis were selected solely based on their size, without distinguishing between public and private sectors. The companies analyzed are presented in Figure 3 according to the Fortune ranking.



**Figure 3. Fortune 500 rankings of logistics companies included in the analysis (2024/TL) (Fortune Türkiye, 2024)**

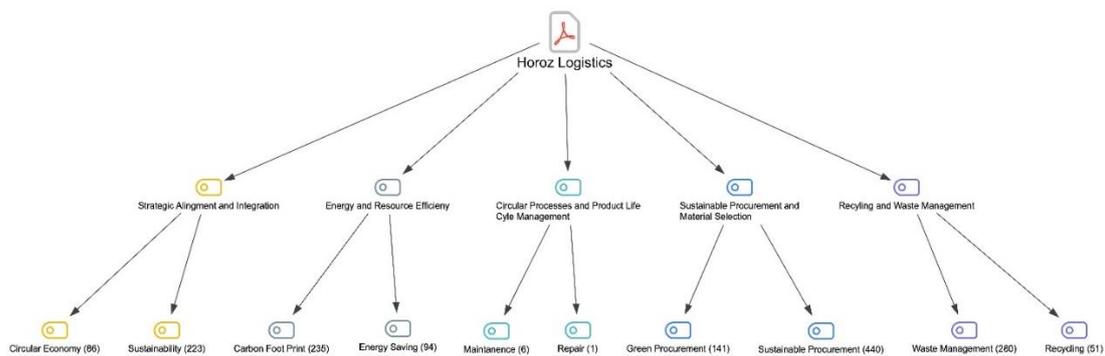
### 2.3. Analysis and Findings

The sustainability reports of the firms included in the analysis were systematically examined within the framework of the main and sub-themes identified in the study. Table 2 presents each firm's practices regarding energy and resource efficiency, product life cycle management, sustainable and green procurement, recycling, and waste management. It is observed that companies such as Horoz Logistics, Borusan Logistics, Çelebi Ground Handling, and the General Directorate of State Airports Authority fully address all themes and sub-themes, while the other firms largely engage in activities related to these areas.

**Table 2. Main and sub-themes of firms' sustainability reports included in the analysis**

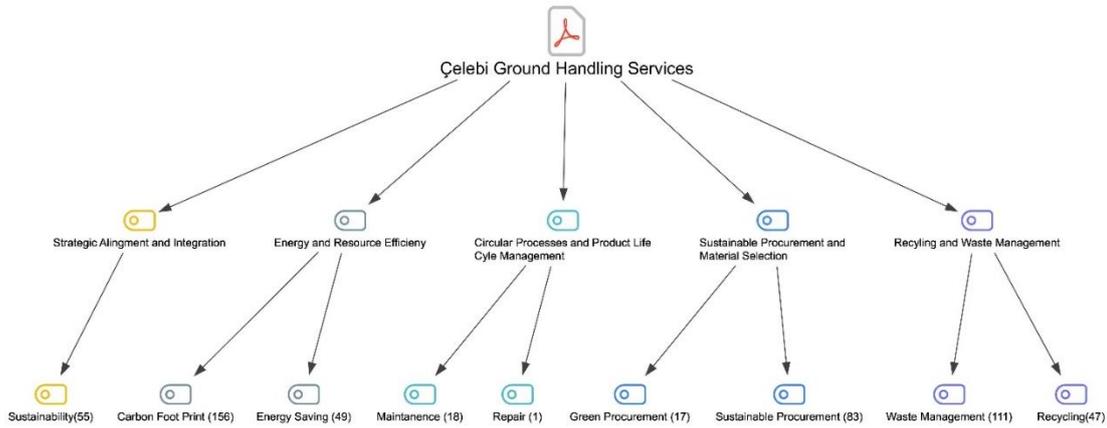
| Main Theme                                      | Energy and Resource Efficiency |               | Circular Processes and Product Life Cycle Management | Sustainable Procurement and Material Selection | Recycling and Waste Management | Strategic Elingmnet and Integration |                  |           |                  |                |
|---|--------------------------------|---------------|--|--|--------------------------------|-------------------------------------|------------------|-----------|------------------|----------------|
|   | Carbon Footprint               | Energy Saving | Maintenance  | Repair   | Green Procurement              | Sustainable Procurement             | Waste Management | Recycling | Circular Economy | Sustainability |
| Horoz Logistics                                 | ✓                              | ✓             | ✓  | ✓  | ✓                              | ✓                                   | ✓                | ✓         | ✓                | ✓              |
| Mars Logistics                                  | ✓                              | ✓             | ✓  |  | ✓                              | ✓                                   | ✓                | ✓         | ✓                | ✓              |
| Netlog Logistics                                | ✓                              | ✓             |  |  |                                | ✓                                   | ✓                | ✓         |                  | ✓              |
| Borusan Logistics                               | ✓                              | ✓             | ✓  | ✓  | ✓                              | ✓                                   | ✓                | ✓         | ✓                | ✓              |
| DSV Air and Sea Transport                       | ✓                              | ✓             |  | ✓  | ✓                              | ✓                                   | ✓                | ✓         | ✓                | ✓              |
| Ekol Logistics                                  | ✓                              | ✓             | ✓  |  | ✓                              | ✓                                   | ✓                | ✓         | ✓                | ✓              |
| General Directorate of State Airports Authority | ✓                              | ✓             | ✓  | ✓  | ✓                              | ✓                                   | ✓                | ✓         | ✓                | ✓              |

The sustainability reports of all firms included in the analysis were coded using the MAXQDA software according to the predetermined main and sub-themes. The summary table generated from the coding process reveals general trends, while each firm's report was also analyzed in detail. Accordingly, a single-case model (Code Hierarchy) was created for each firm, enabling an independent evaluation of each firm's sustainability strategies within the framework of the relevant themes. This methodological approach allows for a comparative and detailed examination of the firms' practices in areas such as recycling, sustainable procurement, circular processes, energy efficiency, and strategic integration while maintaining thematic coherence. In the following section of the study, the single-case model for each firm is presented and interpreted.



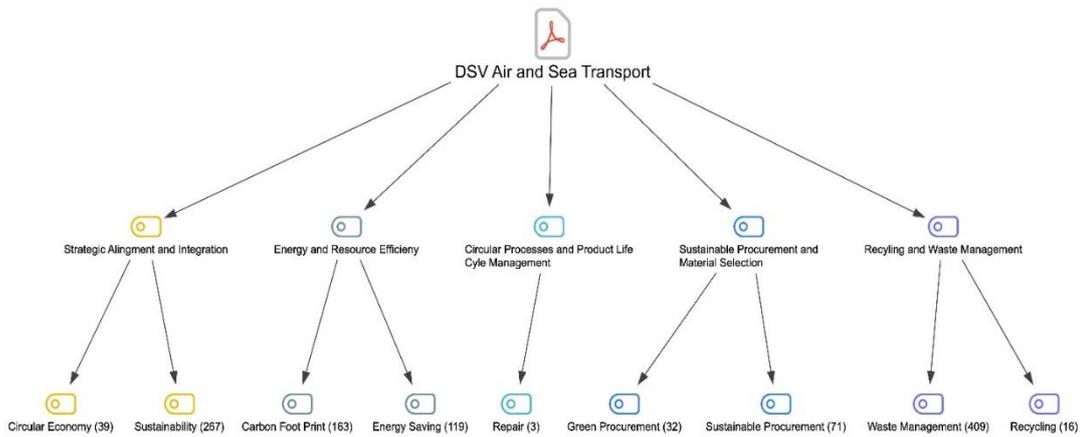
**Figure 4. Horoz Logistics – Single-case model (Code hierarchy)**

An examination of Horoz Logistics' single-case model reveals that the most prominently emphasized sub-theme in the company's 2023 sustainability report (Horoz Lojistik A.Ş., 2024) is Sustainable Procurement, with a coding frequency of 440. This is followed by Waste Management (280), Carbon Footprint (235), Sustainability (223), Green Procurement (141), Energy Saving (94), Circular Economy (86), Recycling (51), Maintenance (6), and Repair (1). These findings indicate that the company places its strongest emphasis on Sustainable Procurement and Material Selection, underscoring its strategic focus on integrating sustainability principles into procurement processes and supply chain decisions.



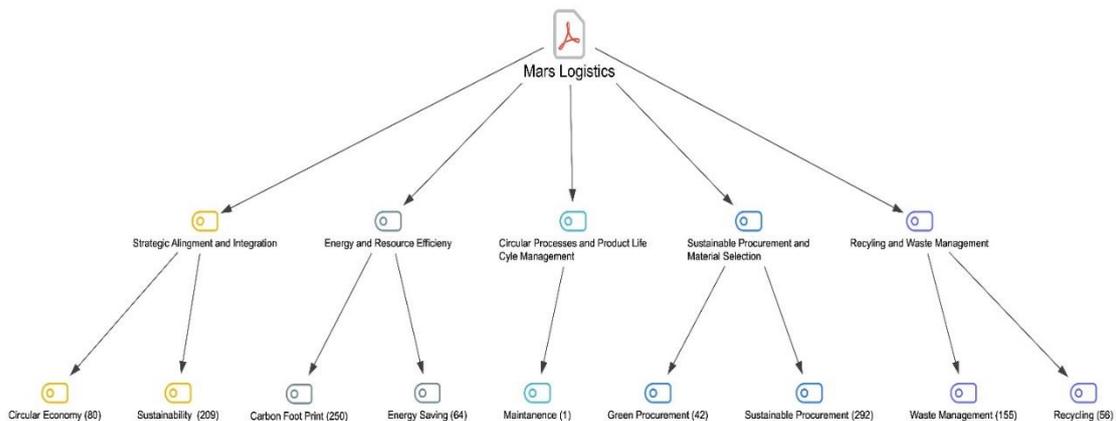
**Figure 5. Çelebi Ground Handling Services – Single-case model (Code hierarchy)**

An analysis of Çelebi Ground Handling Services’ 2023 annual report (Çelebi Yatırımcı İlişkileri, 2023) shows that the most emphasized sub-theme is Carbon Footprint, with a coding frequency of 156. This is followed by Waste Management (111), Sustainable Procurement (83), Sustainability (55), and Energy Saving (49). These results indicate that the company’s primary focus centers on the main theme of Energy and Resource Efficiency, reflecting its strategic commitment to minimizing environmental impacts through improved energy performance and carbon reduction practices.



**Figure 6. DSV Air and Sea Transport – Single case model (Code hierarchy)**

An analysis of DSV Türkiye Air and Sea Transport’s 2024 annual report (DSV A/S., 2023) shows that the sub-theme most prominently emphasized is Waste Management, with a coding frequency of 409. This is followed by Sustainability (267), Carbon Footprint (163), and Energy Saving (119). These findings indicate that the company places its strongest emphasis on the main theme of Recycling and Waste Management, reflecting a strategic commitment to minimizing environmental impact and enhancing operational resource efficiency.



**Figure 7. Mars Logistics – Single-Case model (Code hierarchy)**

An examination of Mars Logistics' 2022 sustainability report (Mars Logistics A.Ş., 2024) demonstrates that the sub-theme receiving the greatest emphasis is Sustainable Procurement, with a coding frequency of 292. This is followed by Carbon Footprint (250), Sustainability (209), and Waste Management (155). The findings also show that the company did not emphasize the Repair sub-theme. Overall, it can be concluded that the main theme most prominently highlighted in the report is Sustainable Procurement and Material Selection, underscoring the firm's strategic orientation toward sustainable sourcing and environmentally responsible supply chain practices.

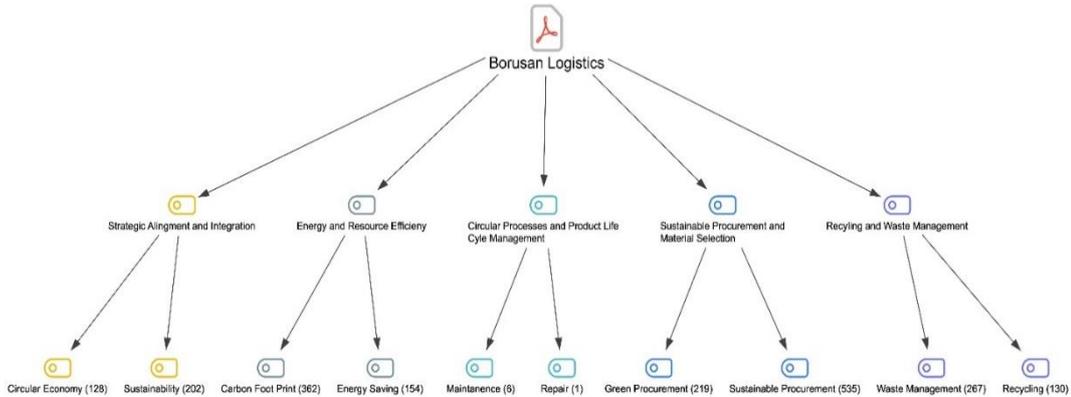


Figure 8. Borusan Logistics – Single-case model (Code hierarchy)

When Borusan Logistics' 2023 sustainability report (Borusan Lojistik A.Ş., 2023) is examined, it is observed that the greatest emphasis is placed on the sub-theme of Sustainable Procurement, with a coding frequency of 535. This is followed by Carbon Footprint (362), Waste Management (267), Green Procurement (219), and Sustainability (202) sub-themes, respectively. Based on these findings, it is evident that the firm's primary focus is on the main theme of Sustainable Procurement and Material Selection.

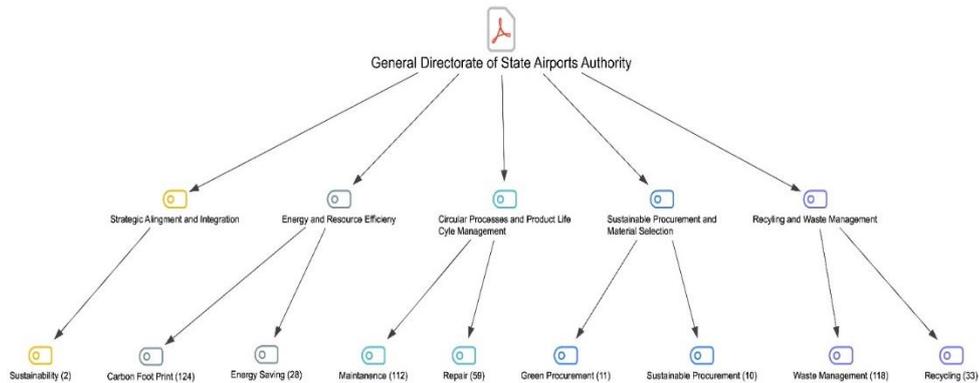
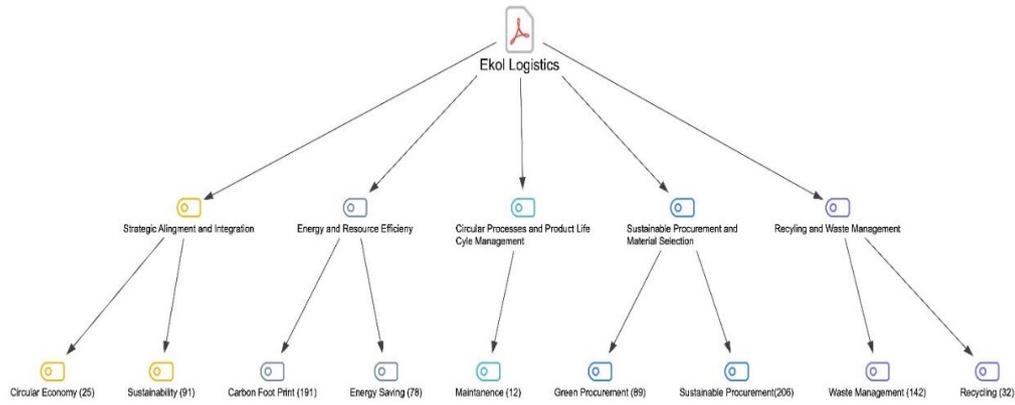


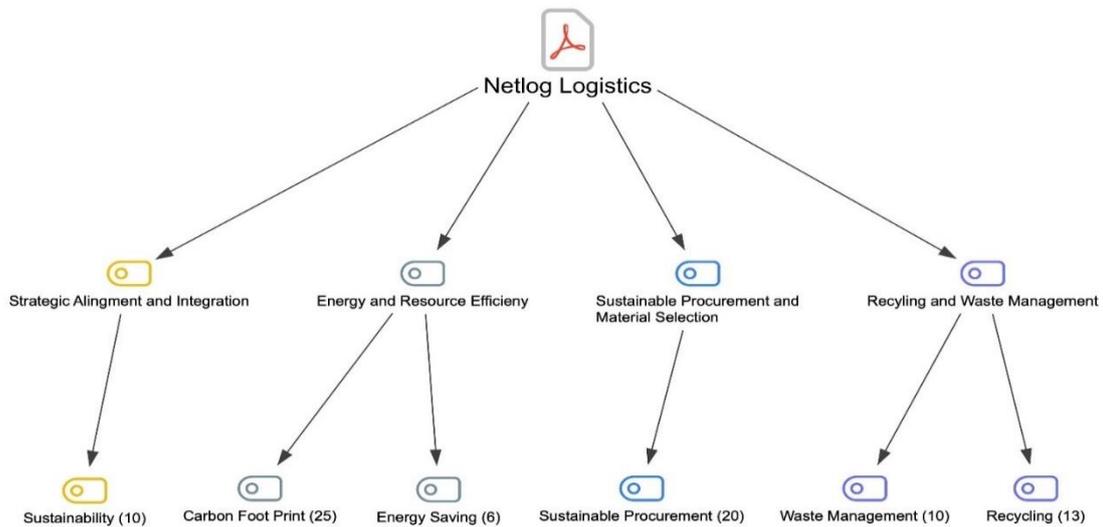
Figure 9. General Directorate of State Airports Authority – Single-case model (Code hierarchy)

The analysis of the General Directorate of State Airports Authority's 2024 annual report (Devlet Hava Meydanları İşletmesi Genel Müdürlüğü, 2024) shows that the sub-themes receiving the highest emphasis are Carbon Footprint (124), Waste Management (118), and Maintenance (112). These findings suggest that the institution's primary focus lies within the main theme of Energy and Resource Efficiency, reflecting its strategic efforts to enhance operational sustainability and optimize resource utilization across airport management activities.



**Figure 10. Ekol Logistics - Single case model (Code hierarchy)**

When examining Ekol Logistics' 2022 sustainability report (Ekol Lojistik A.Ş., 2024), it is observed that the most emphasized sub-theme is Sustainable Procurement, with a coding frequency of 206. This is followed by the sub-themes Carbon Footprint (191) and Waste Management (142). The firm does not emphasize the Repair sub-theme at all. Based on these findings, it is seen that the firm places the greatest emphasis on the main theme of Sustainable Procurement and Material Selection.



**Figure 11. Netlog Logistics - Single case model (Code hierarchy)**

In Netlog Logistics' sustainability model (Netlog Lojistik A.Ş., 2024), the greatest emphasis is placed on the Carbon Footprint sub-theme (25 coding frequency). This is followed by the Sustainable Procurement sub-theme (20). However, there is no emphasis on the Green Procurement, Maintenance, Repair, and Circular Economy sub-themes. The main theme that the company focuses on the most is Energy and Resource Efficiency.

### 3. CONCLUSION and RECOMMENDATIONS

This study investigates the integration of circular economy principles into the procurement processes of Türkiye's largest logistics companies through their sustainability reports. The activity reports of eight logistics firms, listed in the 2024 Fortune 500 Türkiye and publishing sustainability reports, were analyzed using thematic content analysis with the MAXQDA software.

The findings reveal that leading logistics companies in Türkiye significantly incorporate circular economy practices within their sustainable procurement strategies. The firms particularly emphasize the themes of "Sustainable Procurement and Material Selection" and "Energy and Resource Efficiency." While recycling and waste management practices are also prioritized across all companies, the degree of emphasis varies among them. Additionally, the sustainability reports extensively address environmental impact reduction measures such as carbon footprint mitigation and energy saving. This underscores the strategic importance of improving environmental performance and optimizing resource use within the logistics sector.

According to the results, there is a strong awareness and implementation tendency regarding the integration of circular economy principles into procurement processes. However, limited emphasis is observed in certain sub-themes, such as repair and maintenance activities or green procurement practices. This suggests opportunities for further development of sustainable procurement strategies and wider adoption of circular processes throughout the supply chain.

This study supports and contributes to the existing literature on circular economy and sustainable procurement strategies. The literature highlights the environmental and economic benefits of the circular economy, the importance of collaboration within supply chains, and the measurement of sustainability performance. The content analysis, based on the theoretical model of Seuring and Müller (2008) and supported by findings from Altuntaş and Türker (2012), confirms the ongoing advancement of sustainable supply chain management practices. Consistent with Akbal's (2022) definitions of sustainable logistics and green procurement, and Güngör's (2023) observations on circular economy adoption among Borsa İstanbul-listed firms, this study emphasizes the importance of sustainable procurement strategies in reducing environmental impacts and achieving long-term cost savings. Furthermore, the study offers concrete recommendations for enhancing sustainability and resource efficiency through the application of circular economy principles in procurement processes.

Future research could examine the effects of the circular economy and sustainable procurement strategies across firms of different sizes in more detail. Analyzing the differences in sustainability practices among small, medium, and large enterprises would allow for the assessment of scale-based strategy effectiveness. Moreover, sectoral comparisons focusing on the variations in circular economy applications could contribute to the development of more specific and actionable policy recommendations. Moving forward, the impacts of integrating supply chain collaboration and digitalization into sustainable procurement strategies also merit investigation.

### Author Contributions

*Taner Akçacı*: Modelling, Writing-review and editing *Pınar Karaoğlan*: Literature Review, Conceptualization, Methodology, Data Curation, Analysis, Writing-original draft

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No potential conflict of interest was declared by the authors.

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### Compliance with Ethical Standards

It was declared by the author that the tools and methods used in the study do not require the permission of the Ethics Committee.

### Ethical Statement

It was declared by the author that scientific and ethical principles have been followed in this study, and all the sources used have been properly cited.



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