

Rita Remeikienė  
Ligita Gasparėnienė  
Snieguolė Matulienė  
Marek Szarucki

# SECONDARY RAW MATERIALS IN THE CIRCULAR ECONOMY

A MULTI-PERSPECTIVE STUDY





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A Multi-Perspective Study



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Rita Remeikienė  
Mykolas Romeris University  
rita.remeikiene@mruni.eu  
<https://orcid.org/0000-0002-3369-485X>

Ligita Gasparėnienė  
Mykolas Romeris University  
ligitagaspareniene@mruni.eu  
<https://orcid.org/0000-0002-5535-6552>

Snieguolė Matulienė  
Mykolas Romeris University  
m.sniega@mruni.eu  
<https://orcid.org/0000-0001-5379-4412>

Marek Szarucki  
Krakow University of Economics  
szaruckm@uek.krakow.pl  
<https://orcid.org/0000-0001-6147-6094>

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# Introduction

Secondary raw materials represent a fundamental element of the circular economy, where recycling technologies facilitate the efficient reintegration of materials into the production process. This has the effect of reducing reliance on primary resources, which are often non-renewable. According to the Organisation for Economic Co-operation and Development (OECD, 2019), two of the five business models associated with the circular economy are directly linked to secondary raw materials. These models advocate for the use of renewable materials and sustainably sourced biological resources, thereby converting end-of-life products into secondary raw materials. Consequently, it is crucial to analyse secondary raw material markets at both the European Union (EU) and national levels.

The EU Circular Economy Action Plan, updated in 2020, emphasises the significance of secondary raw materials, including aluminium, paper, cardboard, wood, glass, plastic, textiles, construction waste and bio-waste, in the production of primary products. The European Environment Agency's Report No. 12/2022, entitled "Investigating Europe's Secondary Raw Material Markets," provides a comprehensive examination of the eight principal secondary raw material markets (zu Castell-Rudenhause et al., 2022). This document is of particular significance for Lithuania and other countries that joined the EU in 2004, as the updated Action Plan (European Commission, 2020b) calls for concentrated efforts in sectors with high resource consumption and potential for circularity. Specific recommendations are put forth for industries including plastics, textiles, e-waste, food, water and nutrients, packaging, batteries, vehicles, buildings, and construction, with the aim of enhancing Europe's sustainability and competitiveness.

The trade in waste and secondary raw materials is of significant importance, encompassing environmental protection, social justice, and economic sustainability. Proper regulation is essential to ensure effective waste management, reduce environmental pollution, and promote sustainable recycling practices.

The European Union's commitment to a sustainable circular economy posits that waste can be viewed as a resource rather than as mere garbage. This requires a comprehensive approach to the development of legislation and policy, which

must incorporate clear definitions of the circular economy, consideration of equity issues, and robust waste management oversight, particularly in relation to waste trade. It is of the utmost importance to conduct further research into the legal, economic, and management-related aspects in order to ensure the effective implementation of the principles of the circular economy.

Steenmans and Lesniewska (2023a,b) identify four key areas for future circular economy development: systematic legislation and policy development, the delineation of clear boundaries for the circular economy, the consideration of social justice aspects, and the conduct of impact assessments. The EU is also updating legal frameworks for waste trade regulation with the objective of ensuring sustainable waste management and preventing illegal waste trade, thereby supporting the circular economy's growth.

The main objective of this monograph is to explore the theoretical and practical aspects of transforming secondary raw material markets within the circular economy framework. The following four detailed objectives have been selected for further in-depth examination:

- 1) To explore the theoretical, methodological and practical issues associated with the sustainable management of secondary raw materials.
- 2) To discuss the conceptual aspects of secondary raw material markets.
- 3) To investigate the good practices employed in the development of secondary raw material markets.
- 4) To identify the legal aspects of trade in waste and secondary raw materials.

In line with the detailed objectives of this monograph, the basis and source of its content are the selected, published scientific studies, legal documents and EU reports on secondary raw material markets, including circular economy and sustainable development conceptual frameworks and practices. These have been identified in domestic and foreign literature and subjected to critical analysis and evaluation from the perspective of the monograph's adopted objective. This comprehensive analysis comprises a narrative review of existing literature and an examination of legal acts and national court practices in selected countries (case studies).

The study is structured into four distinct sections. The opening chapter, entitled "Sustainable Management of Secondary Raw Materials," initiates the discussion by examining the fundamental assumptions underlying the concept of sustainable management of secondary raw materials. Subsequently, it addresses models for sustainable management, the opportunities and challenges faced by businesses processing secondary raw materials, as well as other critical issues related to this

topic. It includes illustrative examples and case studies that demonstrate the advantages of particular methods and processes in the selected countries.

Chapter 2, entitled “Conceptual Aspects of the Secondary Raw Material Market,” investigates the conceptual aspects of the secondary raw material market, commencing with an examination of its underlying phenomenon and significance within the circular economy. This chapter identifies the key indicators used in the Circular Economy Monitoring System to represent the utilisation of secondary raw materials. Subsequently, the chapter examines the current state and potential future development scenarios of secondary raw material markets in the EU, identifying both growth opportunities and potential challenges. Furthermore, the chapter addresses the significant barriers to market development, including regulatory, economic, and technological obstacles, which will be addressed in subsequent chapters of the study.

Chapter 3, entitled “Analysis of Good Practices in Developing the Secondary Raw Material Markets,” presents an analysis of effective practices in the development of secondary raw material markets, with a particular focus on illustrative examples from Belgium, the Netherlands, and Estonia. The chapter examines the ways in which these countries have advanced their secondary raw material markets through innovative strategies and policies. Furthermore, it considers the role of secondary raw material trading platforms in facilitating market development, highlighting their impact on enhancing market efficiency and connectivity. The case studies and platforms presented offer valuable insights and models for fostering robust secondary raw material markets.

The final chapter, Chapter 4 entitled “Legal Aspects of Trade in Waste and Secondary Raw Materials,” examines the legal aspects of trade in waste and secondary raw materials, beginning with an overview of international regulations governing this trade. It then looks at the specifics of national regulations, highlighting differences and similarities in how different countries deal with trade in raw and secondary materials. In addition, the chapter analyses national court practice in waste management, providing insights into legal precedents and their implications for sustainable waste and resource management in Lithuania. These legal frameworks and judicial practices are crucial for ensuring effective regulation and promoting a sustainable circular economy.

The book is primarily intended for students and academics engaged in the study of circular economy, environmental law professionals, and industry leaders seeking to comprehend and capitalise on secondary raw material markets. Furthermore, non-governmental organisations (NGOs) and advocacy groups engaged in sustainability and environmental protection initiatives may also find the

book a valuable resource for advancing their work. Additionally, the book will be of interest to practitioners and policy-makers, offering valuable insights into sustainable practices, legal frameworks, and regulatory challenges. The book will also be of interest to secondary audiences, including environmental consultants, industry stakeholders, NGOs, and educators, who will find its in-depth analysis and practical examples from the selected countries beneficial.

The present monograph was prepared by an international team of researchers engaged in the project entitled "Towards the Circular Economy Transformation: An assessment of the secondary raw material markets from legal, economic, and management perspectives." The individual contributions of the authors to the book are as follows: Chapter 1 (Marek Szarucki), Chapter 2 (Ligita Gasparėnienė and Rita Remeikienė), Chapter 3 (Rita Remeikienė and Ligita Gasparėnienė), and Chapter 4 (Snieguolė Matulienė). The research was conducted with the support of an internal grant from the Mykolas Romeris University Foundation for the Promotion of Research Activities, specifically the "Funding of Joint Projects of Groups of Scientists and Researchers with a Foreign Scientist" programme, in 2023. The publication was financed through a subsidy granted to the Krakow University of Economics.

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# Summary

The book offers a comprehensive examination of the theoretical and practical aspects of secondary raw material markets within the context of the circular economy. The utilisation of secondary raw materials is of vital importance in the reduction of reliance on non-renewable primary resources, and plays a pivotal role in the development of circular economy business models, as emphasised by the OECD and the EU Circular Economy Action Plan. The study highlights the significance of secondary raw materials (i.e. aluminium, plastics, textiles, etc.) in promoting sustainability and competitiveness, particularly in sectors characterised by high resource consumption. The monograph seeks to provide a multifaceted understanding of secondary raw material markets, offering valuable insights into their development and the legal frameworks necessary to support a sustainable circular economy.

The book is structured into four chapters, each addressing a discrete aspect of the secondary raw material market. The initial chapter addresses the sustainable management of these materials, examining the challenges and opportunities encountered by businesses and including case studies that illustrate successful practices. The second chapter explores the conceptual aspects of the secondary raw material market, examining its role within the circular economy and identifying key indicators and challenges for future market development. The third chapter presents exemplary practices from countries such as Belgium, the Netherlands, and Estonia, with a particular focus on innovative strategies and the role of trading platforms in market advancement. The concluding chapter examines the legal dimensions of trade in waste and secondary raw materials, contrasting international and Lithuania's national regulatory frameworks and analysing judicial practices to elucidate their implications for sustainable resource management.

This monograph represents the collective output of scientific collaboration between authors affiliated with the Public Security Academy of Mykolas Romeris University (Lithuania) and the Strategic Analysis Department of the Krakow University of Economics (Poland).

**Keywords:** secondary raw materials, secondary raw materials markets, management of raw materials, waste management, good practices



The book offers a comprehensive examination of the theoretical and practical aspects of secondary raw material markets within the context of the circular economy. The utilisation of secondary raw materials is of vital importance in the reduction of reliance on non-renewable primary resources, and plays a pivotal role in the development of circular economy business models, as emphasised by the OECD and the EU Circular Economy Action Plan. The study highlights the significance of secondary raw materials (i.e. aluminium, plastics, textiles, etc.) in promoting sustainability and competitiveness, particularly in sectors characterised by high resource consumption. The monograph seeks to provide a multifaceted understanding of secondary raw material markets, offering valuable insights into their development and the legal frameworks necessary to support a sustainable circular economy. The book is structured into four chapters, each addressing a discrete aspect of the secondary raw material market. The initial chapter addresses the sustainable management of these materials, examining the challenges and opportunities encountered by businesses and including case studies that illustrate successful practices. The second chapter explores the conceptual aspects of the secondary raw material market, examining its role within the circular economy and identifying key indicators and challenges for future market development. The third chapter presents exemplary practices from countries such as Belgium, the Netherlands, and Estonia, with a particular focus on innovative strategies and the role of trading platforms in market advancement. The concluding chapter examines the legal dimensions of trade in waste and secondary raw materials, contrasting international and Lithuania's national regulatory frameworks and analysing judicial practices to elucidate their implications for sustainable resource management.