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PREFACE

On behalf of the Scientific and Organizational Committee, it is my honor and great pleasure to present the Proceedings of the 4th EUROSA International Conference, held on 13-16 May 2026 in Vrnjačka Banja, Serbia.

The papers contained in this Proceedings represent current scientific and professional informations in the field of Engineering and Occupational Safety Management, Environmental Engineering and Management, Fire Protection Engineering and Management, Engineering and Management of Disaster and Emergency Protection, and Good use of practice in protection and represent a mix of scientific research and professional opinion, shared with us by participants from academia and industry professionals.

We sincerely thank all the conference participants for their contribution, ensuring the success of the conference. Special thanks to all the participants of the round tables and panel discussions, keynote speakers, chairmen of the sessions and of course the reviewers for their invaluable contribution.

Last but not least, I would like to express my sincere gratitude to all members of the Scientific and Organizing Committee, whose efforts and work led to the successful realization of the EUROSA 2026 conference.

Vrnjačka Banja, May 2026

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REGULATORY CHANGES AND SUSTAINABILITY IMPLICATIONS OF THE NEW WASTE MANAGEMENT LAW IN SERBIA

Perović M.¹, Todorović M.¹, Mitrović T.²

¹Jaroslav Černi Water Institute, Jaroslava Černog 80, 11226 Serbia

² Institute of Physics Belgrade, University of Belgrade Pregrevica 118, 11080 Belgrade, Serbia

(e-mail: marija.perovic@jcerni.rs)

Abstract: Although waste generation has long been associated with human activities and economic development, its effective management remains a persistent environmental challenge, particularly in less developed countries where waste management is often insufficiently developed and infrastructure is limited. Inefficient waste management leads to significant environmental impacts, including soil, water and air contamination, resulting in associated risks to human health. In recent years, Serbia has undertaken significant regulatory reforms aimed at improving the efficiency and sustainability of its waste management system. The amendments to the Law on Waste Management introduce several important changes related to waste prevention, improved classification of waste streams, clearer responsibilities of waste management actors, and increased alignment with European Union environmental legislation. This paper analyzes the key regulatory changes introduced by the amended waste management legislation in Serbia through a regulatory and policy analysis and discusses their implications for environmental protection and sustainable resource management. Particular attention is given to new definitions, obligations for waste producers, digitalization of waste tracking, and improved regulatory control mechanisms. The results indicate that the new legislative framework strengthens the principles of circular economy and promotes more efficient waste prevention, recycling, and resource recovery. At the same time, the implementation of these changes requires improved institutional capacity and stronger cooperation between regulatory authorities, industry, and local governments.

Keywords: *Waste Management; Environmental Legislation; Circular Economy; Recycling; Environmental Policy.*

INTRODUCTION

Waste generation has significantly increased worldwide as a result of economic growth, urbanization, and changes in consumption patterns (European Environment Agency, 2023). Inefficient waste management can cause serious environmental problems, including soil contamination, water pollution, and greenhouse gas emissions. For this reason, modern environmental policies increasingly emphasize the principles of waste prevention, recycling, and circular economy (European Commission, 2008; European Commission, 2020). Effective waste management systems require a comprehensive regulatory framework that clearly defines responsibilities of all actors involved in waste generation, collection, transport, treatment, and disposal. Legislative instruments therefore play a key role in establishing

environmental standards, improving environmental protection, and promoting sustainable resource use. The development of such regulatory frameworks is essential for ensuring environmentally sound waste management practices and reducing the negative impacts of waste on ecosystems and human health (European Environment Agency, 2023).

In Serbia, waste management has been regulated through the Law on Waste Management and several accompanying by-laws that define the responsibilities of waste producers, operators, and regulatory authorities (Government of Serbia, 2009). However, the rapid development of environmental policies within the European Union and the growing need for sustainable resource management have required further harmonization of national legislation with European environmental standards (European Commission, 2008). Recent amendments to Serbian waste management legislation represent an important step toward improving the overall efficiency of the national waste management system. The revised framework introduces clearer definitions of waste categories, strengthens responsibilities of waste producers and operators, and introduces mechanisms for improved monitoring and control of waste flows (Government of Serbia, 2025). These regulatory changes are also consistent with the strategic objectives defined in the Waste Management Programme of the Republic of Serbia for the period 2022–2031, which emphasizes waste prevention, recycling, and the development of modern waste management infrastructure (Ministry of Environmental Protection, 2022). The purpose of this paper is to analyze the key changes introduced by the new waste management legislation in Serbia and to assess their importance for the development of a more sustainable and efficient waste management system.

MATERIALS AND METHODS

The research presented in this paper is based on the analysis of selected regulatory documents governing waste management in the Republic of Serbia. The primary sources include the Law on Waste Management and its recent amendments, as well as relevant national environmental strategies and European Union waste management directives (European Commission, 2008; Government of Serbia, 2009; Government of Serbia, 2025; Ministry of Environmental Protection, 2022). The methodological approach combines regulatory analysis and a comparative review of policy documents related to waste management. The analysis focuses on identifying regulatory changes introduced by the amended legislation and evaluating their implications for waste prevention, recycling, and institutional governance within the national waste management system. Special attention was given to identifying the key legislative changes introduced in the updated regulatory framework and evaluating their potential environmental and institutional implications. The analysis focuses on several key elements of the waste management system: classification of waste streams; responsibilities of waste producers and operators; waste prevention measures; waste tracking and reporting mechanisms; and alignment with EU circular economy principles (European Commission, 2008; European Commission, 2020). In addition to legislative analysis, the study also reviews available reports and policy documents addressing the current status of waste management in

Serbia and the challenges related to its implementation (European Environment Agency, 2023).

RESULTS AND DISCUSSION

Regulatory framework of waste management in Serbia

Waste management in Serbia is regulated through a comprehensive legislative framework that defines the responsibilities of waste producers, collectors, transporters, and treatment operators. The central legal document in this field is the Law on Waste Management, which establishes the basic principles of waste prevention, recycling, and environmentally safe waste treatment (Government of Serbia, 2009; Government of Serbia, 2025).

The legislative framework is largely based on the principles defined by the European Union Waste Framework Directive and aims to gradually harmonize national environmental policies with EU standards. The development of waste management legislation in Serbia is strongly influenced by the process of harmonization with European Union environmental policy. In particular, the EU Waste Framework Directive 2008/98/EC establishes key principles such as the waste hierarchy, extended producer responsibility, and the promotion of recycling and resource recovery (European Commission, 2008).

Recent amendments to Serbian waste management legislation reflect these principles and aim to gradually align national regulations with European environmental standards. These changes are also consistent with the broader objectives of the European Circular Economy Action Plan, which promotes waste prevention, recycling, and more efficient use of resources (European Commission, 2020).

In addition, the national Waste Management Programme of the Republic of Serbia for the period 2022–2031 defines strategic goals for improving waste prevention, recycling rates, and the development of waste management infrastructure (Ministry of Environmental Protection, 2022). Harmonization with these European and national policy frameworks is particularly important in the context of Serbia's EU accession process and the requirements related to Chapter 27 on environment and climate change.

Despite the existence of this regulatory framework, the implementation of waste management policies has faced several challenges, including insufficient infrastructure, limited recycling capacity, and inadequate monitoring of waste flows (European Environment Agency, 2023).

Key changes introduced by the new waste management legislation

The revised waste management legislation introduces several important changes aimed at improving system efficiency and transparency.

One of the most important changes is the introduction of new and more precise definitions related to different waste categories. The law aligns definitions of municipal, industrial, and bio-waste with European environmental terminology, which improves the consistency of

waste reporting and monitoring. The legislation also introduces the concept of food waste and emphasizes prevention measures in accordance with EU waste reduction policies (Government of Serbia, 2025; European Commission, 2008).

Another important aspect concerns the responsibilities of waste producers. While the obligation for certain waste producers to prepare waste management plans already existed in previous legislation, the new law further clarifies and strengthens these requirements. Primary waste producers generating significant quantities of waste are required to prepare waste management plans that describe the types and quantities of waste generated and the methods used for its treatment or disposal (Government of Serbia, 2009; Government of Serbia, 2025). The new legislation also clarifies the roles of different participants in the waste management chain, including collectors, transporters, brokers, and traders. This clearer allocation of responsibilities improves the traceability of waste flows and reduces the risk of illegal waste handling (Government of Serbia, 2025).

Digitalization and monitoring of waste flows

An important innovation introduced by the new legislation is the digitalization of waste tracking systems. The revised legislation also establishes a mandatory digital document for monitoring the movement of certain waste streams (Government of Serbia, 2025).

Digital monitoring of waste flows allows regulatory authorities to obtain more accurate information about the quantities and types of waste generated and treated within the waste management system. Such information is essential for planning waste management infrastructure and evaluating the effectiveness of environmental policies (Ministry of Environmental Protection, 2022).

In addition, the legislation strengthens inspection mechanisms and allows more efficient control of waste management operators. Improved inspection procedures contribute to better enforcement of environmental regulations and help reduce illegal waste disposal practices (Government of Serbia, 2025).

Waste prevention and circular economy principles

The new legislative framework places greater emphasis on waste prevention and circular economy principles. Instead of focusing primarily on waste disposal, modern waste management policies prioritize reduction of waste generation, reuse of materials, and recycling (European Commission, 2008; European Commission, 2020).

The concept of material recovery has been further clarified in the legislation and includes processes such as preparation for reuse, recycling, and backfilling, while distinguishing these processes from energy recovery through incineration (European Commission, 2008; Government of Serbia, 2025).

The promotion of circular economy principles can significantly reduce the environmental impacts associated with waste disposal and contribute to more efficient use of natural

resources. In addition, the development of recycling industries can generate new economic opportunities and support the transition toward a green economy (European Commission, 2020).

The main regulatory changes introduced by the new waste management legislation are summarized in Table 1.

Table 1. Key changes introduced by the updated waste management legislation in Serbia.

Regulatory aspect	Previous regulatory approach	Changes introduced in the updated legislation	Expected environmental impact
Waste definitions	Some waste categories were broadly defined, with limited differentiation between certain waste streams.	More precise definitions aligned with EU terminology, including clearer classification of municipal waste, bio-waste, and food waste.	Improved consistency in reporting and monitoring of waste streams.
Responsibilities of waste producers	Waste producers had general obligations for waste handling and reporting.	Introduction of stricter obligations for primary waste producers, including preparation of waste management plans and improved documentation.	Better control of waste generation and improved environmental responsibility of producers.
Waste tracking and documentation	Waste tracking relied mainly on paper documentation and periodic reporting.	Introduction of digital documentation and electronic tracking of waste movement.	Increased transparency and improved monitoring of waste flows.
Inspection and regulatory control	Inspection procedures existed but monitoring of waste flows was often limited.	Strengthened inspection mechanisms and clearer responsibilities of waste operators.	Reduced risk of illegal waste disposal and improved enforcement of environmental regulations.
Circular economy principles	Waste management policy focused primarily on waste collection and disposal.	Stronger emphasis on waste prevention, recycling, and material recovery in accordance with circular economy principles.	Reduction of landfilling and more efficient use of resources.

These regulatory improvements are expected to enhance transparency, strengthen institutional control, and support the transition toward a circular economy-based waste management system. From a policy perspective, these regulatory changes represent a transition from a

predominantly disposal-oriented waste management model toward a more integrated system based on waste prevention, recycling, and resource recovery principles.

The successful implementation of new waste management legislation depends not only on the regulatory framework itself but also on institutional capacity, technical infrastructure, and the cooperation of different stakeholders. Although the updated legislation introduces clearer responsibilities and improved monitoring mechanisms, several practical challenges may influence its implementation. One of the key challenges relates to the development of adequate waste management infrastructure. Many municipalities still rely heavily on landfilling as the primary method of waste disposal, while recycling facilities and waste treatment plants remain limited. Expanding recycling infrastructure and improving waste separation systems will therefore be essential for achieving the objectives of the new legislation. Another important aspect concerns administrative capacity and regulatory control. Effective implementation requires well-trained inspection services and reliable systems for monitoring waste flow. The introduction of digital tracking systems may significantly improve transparency; however, it also requires technical capacity and coordination between institutions. These developments are also particularly relevant in the context of Serbia's European Union accession process, where further alignment with the EU environmental acquis under Chapter 27 requires strengthening regulatory implementation, institutional capacity, and monitoring systems.

Public awareness and participation also play an important role in the success of waste management policies. Waste separation at the source and responsible consumption patterns depend largely on public understanding of environmental issues and the availability of appropriate collection systems.

The introduction of clearer regulatory responsibilities and improved monitoring mechanisms represents an important step toward strengthening the waste management system in Serbia. However, the long-term success of these measures will largely depend on effective implementation, adequate institutional capacity, and continuous investment in waste management infrastructure. At the same time, the relatively low level of public awareness regarding proper waste management practices remains an additional challenge for the successful implementation of these reforms.

CONCLUSION

Recent amendments to waste management legislation in Serbia represent an important step toward improving environmental governance and aligning national regulations with European Union environmental policy. The analysis presented in this paper shows that the new regulatory framework introduces clearer definitions of waste categories, strengthens the responsibilities of waste producers, and improves mechanisms for monitoring and transparency of waste flows. The introduction of digital waste tracking systems and enhanced inspection procedures contributes to better control of waste management activities and

reduces the risk of illegal waste handling. At the same time, the stronger emphasis on waste prevention and circular economy principles reflects broader international trends in sustainable resource management. Nevertheless, the successful implementation of the new legislative framework will depend on the development of adequate waste management infrastructure, strengthening institutional capacity, and improving cooperation between public authorities, industry, and local communities. Further progress in these areas will be essential for achieving the long-term objectives of environmental protection, sustainable resource use, and improved quality of life, which ultimately represents a shared responsibility of institutions, industry, and society.

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