

THE CIRCULAR ECONOMY IN THE EUROPEAN UNION: LEGAL FOUNDATIONS AND REGULATORY FRAMEWORKS

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Abstract

This paper provides a comprehensive legal analysis of the time limits governing consumers' rights to claim and request product repairs. It focuses on the new EU Directive promoting product lifecycle extension through reducing, reusing, and repairing. The Directive mandates that manufacturers and sellers enable product repairs up to ten years from the date of manufacture, marking a significant advance towards sustainable consumption and enhanced consumer protection, but only for certain kinds of goods.

Scientific contribution lies in the author's critical examination of the intersection between the newly introduced obligations under the Directive and existing consumer rights under warranties and guarantees. By analysing potential overlaps and conflicts, the paper sheds light on the legal implications and challenges of harmonising these rights within current legal frameworks in selected member states.

The critical legal questions to be addressed will include alignment with existing laws and determining how the directive's mandate for repair for up to ten years aligns with existing national laws on warranties and guarantees. Additionally, stakeholders' responsibilities will be examined in relation to the analysis of the legal obligations of manufacturers and sellers under the Directive, as well as their interactions with consumers' rights to claim defects. In conclusion, the implementation challenges will be addressed to ensure the effective implementation of the Directive into national legislation.

By addressing these questions, the paper aims to provide actionable recommendations to facilitate the effective implementation of the Directive. The findings contribute to the broader discourse on consumer law reform, environmental sustainability, and the integration of circular economy principles into legal systems.

Keywords: *European Union, environmental law, circular economy, consumer protection, sustainable development*

JEL Classification: K32, Q58, L51

1. INTRODUCTION

The European Union has positioned itself as a global frontrunner in environmental policy, explicitly embedding sustainable development and circular economy principles within its strategic framework.

This commitment is exemplified by the establishment of a comprehensive legal architecture designed to confront environmental challenges and foster a transition towards a circular economy (Camilleri, 2020).

This paper undertakes a detailed examination of the EU's legal framework, dissecting the key directives, regulations, and policy instruments that collectively shape the EU's approach, with a particular emphasis on their legal underpinnings and practical ramifications. The EU's pursuit of a circular economy is predicated on a complex interaction of legislative measures and strategic policy initiatives (Mak & Lujinovic, 2019).

Prominent among these are the Circular Economy Action Plan, the European Green Deal, and a multitude of directives addressing specific facets of waste management, product design, and resource efficiency (Malinauskaitė & Erdem, 2021). This multifaceted approach underscores the EU's recognition of the interconnectedness of environmental challenges and the need for holistic, integrated solutions. At the heart of the EU's circular economy strategy lies a concerted effort to minimize waste generation through the promotion of reuse and recycling practices (Mikula *et al.*, 2020). Recent directives have fortified the legal framework governing these domains, establishing ambitious targets and fostering innovative approaches to waste management (Negrete-Cardoso *et al.*, 2022). The transition to a circular economy necessitates substantial modifications in both production and consumption patterns, requiring a fundamental shift away from the linear model of "take-make-dispose" (Koszevska, 2018).

Specifically, the EU's circular economy framework necessitates a comprehensive re-evaluation of product design protocols, manufacturing processes, and established patterns of consumer behavior, all with the overarching objective of minimizing waste generation and simultaneously maximizing the efficient utilization of resources (Горюхова *et al.*, 2023). The effective implementation of circular economy principles demands a collaborative effort involving governments, businesses, and individual citizens, each playing a vital role in realizing the EU's ambitious environmental goals.

2. LITERATURE REVIEW

The legal basis of these instruments will be meticulously analysed, exploring their scope, objectives, and enforcement mechanisms, thus providing a comprehensive understanding of the EU's circular economy framework.

This paper also investigates the challenges and opportunities associated with implementing these regulations across the diverse landscape of EU member states, acknowledging the varied economic, social, and environmental contexts that shape their implementation. The effectiveness of the EU's circular economy framework hinges on its ability to adapt to the specific circumstances of individual member states, while simultaneously maintaining a cohesive and harmonised approach across the Union. A crucial aspect of the EU's circular economy strategy

involves reducing waste through the promotion of reuse and recycling initiatives. Recent directives have strengthened the legal framework governing waste management, setting ambitious targets and promoting innovative approaches (Shevchenko, *et al.*, 2019). These directives have significant legal implications for businesses, consumers, and the environment, influencing waste management practices and promoting sustainability. The EU's commitment extends beyond waste management, encompassing broader aspects of sustainable development through initiatives like the European Green Deal (Mazur-Wierzbicka, 2021). This initiative sets ambitious targets for climate neutrality and resource efficiency, signifying a comprehensive approach to environmental protection. Moreover, the EU's commitment to environmental stewardship extends beyond waste management, encompassing a broader range of sustainable development objectives outlined in landmark initiatives, such as the European Green Deal. (Viles *et al.*, 2020).

The transition to a circular economy represents a paradigm shift that requires not only regulatory changes but also technological innovation, investment in infrastructure, and a fundamental change in consumer behaviour (Suárez *et al.*, 2023). The EU's circular economy framework is not without its challenges, as the transition from a linear to a circular economy requires significant investments, technological advancements, and behavioural changes across all sectors of society (Petit-Boix & Leipold, 2018). The EU's circular economy strategy aims to address these challenges by establishing a supportive legal and regulatory framework, fostering innovation, and increasing public awareness of the benefits of a circular economy (Regolo *et al.*, 2024). The integration of circular economy principles into various industries, such as the fashion sector, provides a pathway towards sustainability, aligning with European legislation, including the European Green Deal and the UN Sustainable Development Goals (Shirvanimoghaddam *et al.*, 2020). Effective implementation requires collaboration among stakeholders, including businesses, policymakers, and consumers, to overcome barriers and realise the full potential of a circular economy (Milios, 2021; Taelman *et al.*, 2018).

3. DISCUSSION

The European Union has emerged as a global frontrunner in environmental policy, demonstrating a resolute commitment to sustainable development and the principles of a circular economy (Idir *et al.*, 2025). The EU's proactive stance is evident in its comprehensive legal framework designed to address environmental challenges and facilitate the transition towards a circular economy, marking a significant stride in global environmental governance (Morris *et al.*, 2021). The Circular Economy Action Plan, an integral component of the broader European Green Deal, serves as a strategic roadmap for achieving a climate-neutral, resource-efficient, and competitive economy (Husain *et al.*, 2024). This plan

encompasses a wide array of initiatives aimed at transforming the EU's economy into a circular model, where resources are utilized more efficiently and waste is minimized (Hadi *et al.*, 2021). This transition necessitates a fundamental shift in how products are designed, produced, consumed, and recycled, requiring a collaborative effort from all stakeholders. The concept of a circular economy is gaining global recognition as a viable approach to mitigating climate change and promoting sustainable development (Mukhlis, 2021). A circular economy necessitates a shift from a linear "take-make-dispose" model to a closed-loop system where resources are kept in use for as long as possible, reducing waste and minimizing environmental impact (Rahla *et al.*, 2021). Ultimately, the EU's circular economy framework seeks to create a more resilient and sustainable economy that benefits both the environment and society. Moreover, the EU's commitment to environmental protection extends beyond its borders, as it actively promotes circular economy principles on a global scale. The EU's circular economy framework is a multifaceted construct, resting upon a complex interplay of legislative acts and policy initiatives.

EU legal framework for circular economy is composed of the Circular Economy Action Plan, the European Green Deal, and numerous directives addressing specific aspects of waste management, product design, and resource efficiency (Jones & Comfort, 2021). Analyzing the legal basis of these instruments, exploring their scope, objectives, and enforcement mechanisms is highly important. The EU's approach is rooted in the principles of sustainability, resource efficiency, and waste reduction, aiming to minimize environmental impact and promote economic growth. The EU's circular economy strategy is underpinned by a comprehensive set of legal instruments, including directives, regulations, and decisions that address various aspects of the product lifecycle, from design and production to consumption and waste management. Key directives include the Waste Framework Directive, the Packaging and Packaging Waste Directive, and the End-of-Life Vehicles Directive, which set targets for waste reduction, recycling, and recovery (Milios, 2017). These directives provide a legal framework for member states to implement circular economy initiatives at the national level, while also ensuring a harmonized approach across the EU (Foggia & Beccarello, 2023). Member states are responsible for transposing EU directives into national law and ensuring their effective implementation and enforcement. The European Commission plays a crucial role in monitoring the implementation of EU environmental law and taking enforcement action against member states that fail to comply.

Waste reduction through reuse and recycling is a central tenet of the EU's circular economy strategy, as demonstrated by recent directives that have fortified the legal framework governing these domains, establishing ambitious targets and fostering innovative waste management approaches. The EU's waste management legislation is a cornerstone of its circular economy strategy, setting ambitious

targets for reducing waste generation, increasing recycling rates, and limiting the amount of waste that is landfilled. These directives have far-reaching implications for businesses, consumers, and the environment, influencing product design, manufacturing processes, and consumption patterns. Packaging and Packaging Waste Directive encompasses all packaging placed on the European market and all packaging waste, regardless of the material used (Weale *et al.*, 2002). The directives promote the reuse, recycling and other forms of recovering of packaging waste, instead of its final disposal, thus contributing to the transition towards a circular economy (Weale *et al.*, 2002). The Packaging and Packaging Waste Directive mandates EU countries to adopt measures such as national programs and incentives through extended producer responsibility schemes, to prevent packaging waste and minimize the environmental impact of packaging (Weale *et al.*, 2002). The Landfill Directive aims to prevent or reduce the negative effects of the landfilling of waste on the environment, in particular on surface water, groundwater, soil, air and human health. The Landfill Directive has been crucial in diverting biodegradable municipal waste away from landfills, thereby reducing greenhouse gas emissions and promoting the recovery of valuable materials. The Waste Electrical and Electronic Equipment Directive is focused on the collection, treatment, and recycling of electronic waste (Protopapa *et al.*, 2021). The directive sets collection targets for e-waste and requires member states to establish systems for the proper management of this waste stream. It promotes the separate collection, treatment, and recycling of e-waste, diverting it from landfills and preventing the release of hazardous substances into the environment.

4. METHODOLOGY

Beyond its focus on waste management, the EU's commitment to environmental protection extends to encompass broader dimensions of sustainable development, as exemplified by the European Green Deal, a landmark initiative that sets ambitious objectives for achieving climate neutrality and promoting resource efficiency across various

sectors. The Waste Framework Directive establishes a waste hierarchy, prioritizing prevention, preparing for reuse, recycling, other recovery (e.g., energy recovery), and, as the least preferred option, disposal (Almansour & Akrami, 2024). This directive provides a framework for waste management planning and sets targets for recycling municipal waste. It requires member states to take measures to prevent waste generation, promote the separate collection of waste, and ensure that waste is treated in accordance with the waste hierarchy. The Industrial Emissions Directive aims to prevent and reduce pollution from industrial activities. It requires industrial installations to obtain permits that set emission limits and require the use of best available techniques to prevent and control pollution. The Eco-design Directive sets ecological requirements for

energy-related products, promoting energy efficiency and reducing the environmental impact of products throughout their lifecycle.

The European Green Deal, the EU's flagship initiative, sets ambitious targets for climate neutrality and resource efficiency (Smol *et al.*, 2020). The Green Deal encompasses a wide range of policy areas, including climate action, energy, transport, industry, agriculture, and biodiversity. It aims to transform the EU into a modern, resource-efficient, and competitive economy, ensuring a high level of environmental protection and improving the health and well-being of citizens. The Circular Economy Action Plan provides a comprehensive framework for promoting circular economy principles across various sectors. It includes measures to promote sustainable product design, reduce waste generation, increase recycling rates, and create markets for secondary raw materials (Antoniadou *et al.*, 2021). The EU's approach involves open research and social enterprise, integrating connected communities into a resource-efficient and competitive economy (Rowan & Casey, 2021). The European Green Deal recognizes the crucial role of ecosystems and their services as the foundation for a fair, healthy, and prosperous society, emphasizing sustainable and just development at the center of European growth towards 2050 (Zorpas, 2020). Strategies that aim to enhance the quality of life and influence public discourse should focus on reducing the environmental impact through sustainable resource use, environmental management systems, and comprehensive impact assessments. Achieving climate neutrality by 2050 necessitates a transition to renewable energy sources, reducing greenhouse gas emissions, and promoting a circular economy (Podkolzina *et al.*, 2023). The EU's commitment involves integrating economic, technological, and social factors to decouple economic growth from environmental degradation (Doran *et al.*, 2025; Luca *et al.*, 2021; Wang & Chiu, 2013).

The transition towards a circular economy is gaining momentum in the policy plans of many countries, exemplified by the European Commission's strategic agenda to transform the EU economy into a circular one (Giannoccaro *et al.*, 2021). The EU is committed to becoming the first climate-neutral continent by 2050, with the energy sector playing a pivotal role in achieving this goal (Hao & Dragomir, 2025). The EU aims to cut emissions by at least 55% by 2030 compared to 1990 levels (Mallouppas *et al.*, 2022). This transition involves the integration of renewable energy sources, improvements in energy efficiency, and the deployment of sustainable technologies. The EU's circular economy framework aims to decouple economic growth from resource use and environmental impact by transforming how goods are produced, used, and discarded (Dăce *et al.*, 2024). This entails rethinking and redesigning products, processes, value chains, and business models to minimize waste and maximize resource efficiency (Goovaerts *et al.*, 2018). Entrepreneurial clusters play a crucial role in advancing the circular bioeconomy and fostering innovation. These clusters bring together diverse

stakeholders, including businesses, research institutions, and policymakers, to collaborate and drive the transition towards a more sustainable and circular economy (Vajda *et al.*, 2025). The EU's approach encompasses a broad range of policy areas, including sustainable product design, waste management, and the promotion of secondary raw materials markets.

The EU's emphasis on sustainability extends beyond waste management to encompass a comprehensive vision for environmental protection and resource efficiency. To support the energy transition, institutions like the European Investment Bank are investing in new technologies that promote a circular economy (Pintilie, 2021).

5. RESULTS

The regulatory landscape governing the circular economy within the European Union is characterised by a multifaceted framework comprising directives, regulations, and policy instruments, each contributing to the overarching goal of fostering sustainable development and resource efficiency. This framework necessitates a collaborative approach, involving governments, industries, and citizens, to ensure the successful implementation of circular economy principles across diverse sectors. The transition from a linear to a circular economy is formally inscribed in the EU's new Circular Economy Action Plan and reflected in several aspects of policymaking (Duquennoi & Martínéz, 2022). The EU's commitment to environmental protection and sustainable development has led to the establishment of a robust legal framework aimed at addressing environmental challenges and promoting a circular economy. The circular economy presents opportunities for businesses with a high tendency towards innovation and entrepreneurship (Luis & Celma, 2020). Common practices of the circular economy and the bioeconomy not only contribute to the reduction of the impact on natural resources but also represent an opportunity for the creation of employment and local development (Duque-Acevedo *et al.*, 2020).

The EU's circular economy framework is built upon a complex interplay of legislative acts and policy initiatives, with key instruments including the Circular Economy Action Plan, the European Green Deal, and numerous directives addressing specific aspects of waste management, product design, and resource efficiency. These directives and regulations set specific targets for waste reduction, recycling rates, and the phasing out of harmful substances in products. The global pursuit of the CE has yielded diverse frameworks, each shaped by regional priorities, resource constraints, and governance structures (Alhowaish & Alkubur, 2025). The EU's waste management hierarchy prioritizes prevention, reuse, recycling, and recovery, with disposal as the last resort. This hierarchy guides waste management policies and practices across member states. This involves promoting the design of products that are durable, repairable, and recyclable, as well as establishing systems for the collection, sorting, and

processing of waste materials. The EU promotes the adoption of extended producer responsibility schemes, which hold producers accountable for the end-of-life management of their products.

To achieve a circular economy, it is essential to promote reuse, repair and refurbishment, remanufacturing, and recycling of existing materials and products (Sah & Hong, 2024). The EU's approach involves creating incentives for businesses to adopt circular practices, such as offering tax breaks to companies that utilise recycled materials or implement waste reduction strategies.

6. CONCLUSION

The European Union's approach to sustainability is rooted in a comprehensive legal and regulatory framework designed to promote environmental protection, resource efficiency, and the transition to a circular economy.

The EU's commitment to environmental protection extends beyond waste management, encompassing broader aspects of sustainable development, as evidenced by the European Green Deal, which sets ambitious targets for climate neutrality and resource efficiency. The EU's legal framework governing waste management and recycling has been strengthened through recent directives, setting ambitious targets and promoting innovative approaches to waste management (Šarc *et al.*, 2019). These directives aim to reduce the amount of waste generated, increase recycling rates, and promote the use of recycled materials in new products. The Waste Framework Directive introduced by the European Union describes 'prevention' as the most preferable management strategy for waste management, followed by 'preparing for re-use', 'recycling', 'recovery', and finally 'disposal' (Ismail & Hanafiah, 2019). The EU's regulatory framework seeks to ensure that waste management practices are environmentally sound and economically viable. This commitment is reflected in various directives and regulations aimed at promoting sustainable product design, waste reduction, and the development of markets for secondary raw materials (Boniface *et al.*, 2024).

The European Union has emerged as a global leader in promoting the circular economy, implementing various directives and regulations to reduce waste, promote recycling, and foster sustainable development. The EU's approach involves setting ambitious targets for waste reduction and recycling, as well as promoting the development of new technologies and business models that support the circular economy. Economic incentives play a crucial role in promoting circular practices, but they are often insufficient or poorly targeted (Idir *et al.*, 2025). The EU's regulatory framework for the circular economy encompasses a wide range of policy areas, including waste management, product design, and resource efficiency.

The EU's regulatory framework is designed to promote a shift away from a linear "take-make-dispose" model towards a circular economy in which resources are used more efficiently and waste is minimized (Negrete-Cardoso *et al.*, 2022). The implementation of the circular economy requires changing the mindset of consumers and businesses, promoting collaboration across the value chain, and investing in research and innovation. This transition involves creating new markets for recycled materials, developing innovative technologies for waste treatment, and promoting sustainable consumption patterns. Ongoing training programs and awareness campaigns are needed to inform professionals about the benefits of the circular economy and modern techniques for recycling and reusing materials (Idir *et al.*, 2025). The linear economy principles, based on the raw materials transformation into final products, and their subsequent discharge as waste, cannot be longer followed (Zanoletti *et al.*, 2021). The circular economy practices have the potential to address these issues, by decoupling economic growth from resource consumption and waste generation (Grdić *et al.*, 2020).

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