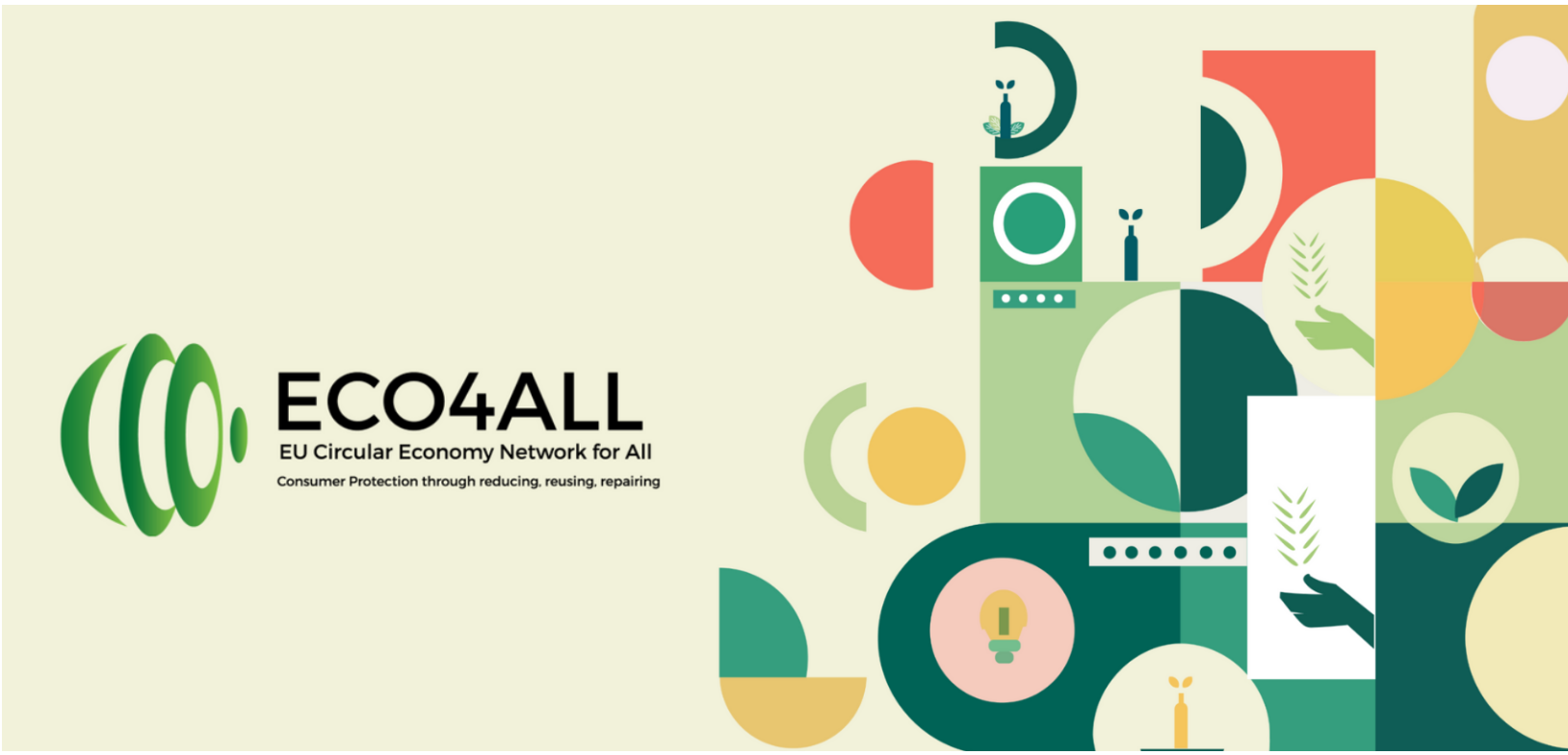
CONSUMER RIGHTS IN THE AGE OF THE CIRCULAR ECONOMY: TOWARDS SUSTAINABLE AND FAIR PRODUCTION AND CONSUMPTION PRACTICES

COST Action CA22124 – ECO4ALL

Book of Abstracts



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"CONSUMER RIGHTS IN THE AGE OF THE CIRCULAR ECONOMY: TOWARDS SUSTAINABLE AND FAIR PRODUCTION AND CONSUMPTION PRACTICES"

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CONFERENCE PROGRAMME

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09:30 – 10.00	**Registration of participants**
Conference Opening ***Moderator: Maria Menshikova (Universitas Mercatorum, Italy)*** ***Room 1*** **Zoom: https://us06web.zoom.us/meeting/register/VZW9Jwn5Tp28hG0g1DmmJQ**	
10.00 – 10:30	**Institutional Greetings:** - **Prof. Marco Mocella -** Full Professor in Labour Law, Rector's Delegate for Internationalization, Universitas Mercatorum (Italy), Director of the Department of "Law and Institutions" - **Prof. Alessandra Micozzi** - Full Professor of Applied Economics, Dean of the Faculty of Social and Communication Sciences, Coordinator of the PhD in "Sustainability and ESG Agenda" **Conference Opening:** - **Olesea Plotnic -** Action Chair, Moldova State University (Moldova) - **Maria Menshikova -** WG3 Leader, Universitas Mercatorum (Italy)
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	Salvija Muleviciene, Mykolas Romeris University (Lithuania) *How Far Law Can Go: The Logic and Limits of Using Legal Tools to Support Circular Economy*
	Anton Fedosov, FHNW University of Applied Sciences and Arts Northwestern Switzerland (Switzerland) *Designing for Technology-Mediated Sharing Practices and Sustainable Consumption*
	Roido Mitoula, Harokopio University of Athens (Greece) *SDG 9 and Circular Economy: the Role of Citizens in Promoting Sustainable and Fair Production and Consumption*
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11.15 - 11.45	***Coffee break networking***
Special Session 4 for Young Researchers: From Awareness to Action: Engaging Consumers and Businesses in Circular Practices ***Moderator: Tarlan Ahmadov (University of Eastern Finland)*** ***Room 3*** **Zoom: https://us06web.zoom.us/meeting/register/uTmKHIR_Tu2Dyvc35iuGEw**	
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ABSTRACTS

Keynote Speakers

DESIGNING AND ORGANIZING SUSTAINABLE WORK IN THE AGE OF THE CIRCULAR ECONOMY

STEFANO DI LAURO
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Abstract. The transition to a circular economy calls for a fundamental rethinking of how organizations create and sustain value, not only through materials and production systems, but also through the design and organization of work. At the heart of this transformation lies the need to use all organizational resources more effectively, including human resources, by fostering sustainable and human-centered work practices.
At the same time, digital technologies, particularly artificial intelligence (AI) and data-driven systems, are rapidly reshaping the nature of work. From supporting decision-making to enabling algorithmic management and automation, these technologies are transforming how work is performed, organized, and experienced. While they offer significant opportunities to enhance productivity, innovation, and employee capabilities, they also introduce critical challenges related to ethics, governance, and the quality of work.
This keynote explores how AI-mediated work intersects with the goals of the circular economy, raising pressing questions about how sustainable work can be designed and governed in increasingly digitalized environments. Drawing on emerging research and insights from People Analytics and digital HRM, it highlights both the opportunities and risks associated with data-driven approaches to managing work, including issues of privacy, surveillance, bias, and accountability.
The keynote argues that current approaches to Responsible AI remain insufficiently attuned to work and employment concerns. To ensure that digital transformation supports sustainable and decent work, it calls for grounding AI governance in established labor standards and human-centered principles. In doing so, it offers a forward-looking perspective on how organizations can align technological innovation with social and environmental responsibility in the age of the circular economy.

Keywords: circular economy, artificial intelligence, sustainable work, AI governance, human-centered work

ALIGNING LAW DESIGN AND POLICY PATHWAYS TO FAIR REGULATORY INCENTIVES IN CIRCULAR TRANSITION

MIHAELA TOFAN
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Abstract. This paper presents the research results of the comprehensive legal analysis of law design and policy pathways to fair regulatory incentives in circular transition. It focuses on the new EU regulation promoting product lifecycle extension through reducing, reusing, and repairing and the obligation its brings to entrepreneurs (sellers, distributors, productors etc.), and it enable product repairs up to ten years from the date of manufacture, marking a significant advance towards sustainable consumption and enhanced circular economy support, but only for certain kinds of goods.
Scientific contribution lies in the author's critical examination of the intersection between the newly introduced EU regulation and the incentives provided at national level for citizen implication into the circular transition. By analysing potential overlaps and conflicts between European and domestic legal systems, the paper sheds light on the legal implications and challenges of harmonising these legal previsions current legal frameworks in selected member states.
The critical legal questions to be addressed will include alignment with existing laws and determining how the EU regulation for repair for up to ten years aligns with existing national laws on warranties and guarantees. The paper aims to provide actionable recommendations to facilitate the effective implementation, while the findings of the research contribute to the broader discourse on circularity transition, environmental sustainability, and the integration of circular economy principles into legal systems.

Keywords: European Union, circular economy, efficient regulation for incentives, Romanian case.

HOW FAR LAW CAN GO: THE LOGIC AND LIMITS OF USING LEGAL TOOLS TO SUPPORT CIRCULAR ECONOMY

SALVIJA MULEVICIENE
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Abstract. This paper maps the legal transition from Point A – the current reality in which legal frameworks (especially at national level) remain largely tailored to a linear economy – toward Point B, where law becomes instrumental in fostering circular rethinking. The journey from A to B is neither straightforward nor linear. It requires grasping both the transformative potential of legal tools and the structural barriers that hold back change. The analysis therefore explores the role, potential and limits of legal tools in steering the shift from linear to circular economic models.

Behind the logic of using legal tools to support circular economy (such as the EU's Ecodesign for Sustainable Products Regulation, Extended Producer Responsibility, waste hierarchy rules, the emerging Right to Repair, and market incentives like reduced taxes on recycled materials and green public procurement) lies the idea that law should transform voluntary circular practices into enforceable standards. Yet the effectiveness of this approach still faces significant constraints, notably the costs and burdens of enforcement for businesses and society. The balance between regulatory ambition and economic competitiveness requires careful calibration so that legal regulation supports, rather than suppresses, innovation.

The path forward calls for a systemic approach, while recognising that "more rules" do not automatically mean "more circular economy". At this stage, it is also essential to focus on how to enable, i.e. through good practices, an environment in which sustainability and economic efficiency are no longer regarded as opposing goals.

Keywords: circular economy, consumer rights, legal framework, logic and limit.

DESIGNING FOR TECHNOLOGY-MEDIATED SHARING PRACTICES AND SUSTAINABLE CONSUMPTION

ANTON FEDOSOV
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Abstract. Online social networks have made sharing personal experiences with others a common activity. Furthermore, modern mobile apps, cloud services, and wearable technologies expanded the scope of shared content on the internet from personal media to individual preferences and activities to information about real-world things. This talk explores these practices within two emergent sharing contexts: personal activity tracking and sharing economy services. The overarching research question of my work is to explore how people experience sharing in the digital context and in the real world. These explorations not only lead to a deeper understanding of current practices, needs, and concerns of sharing personal digital and physical possessions in our everyday lives, but also inform designers on how to bridge physical and digital experiences in this context.

Keywords: collaborative consumption; sharing economy; sustainability; interaction design; human-computer interaction; design toolkit.

SDG 9 AND CIRCULAR ECONOMY: THE ROLE OF CITIZENS IN PROMOTING SUSTAINABLE AND FAIR PRODUCTION AND CONSUMPTION

ROIDO MITOULA
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Abstract. The present paper examines the implementation of the 17 Global Sustainable Development Goals (SDGs), focusing on SDG 9, which concerns “Industry, Innovation, Infrastructure”. Initially, the predictions of this specific goal, as set by the United Nations (UN), the current global situation and the main problems that arise in the areas covered by the 9th SDG, are described and analyzed. In order to achieve a more sustainable planet, the role of the UN is crucial, which since 2015 has been supporting developed and developing countries towards the success of Goal 9. In addition to global policies and actions, the paper also explores the policies, actions, programs and funding of the EU that aim to achieve the success of SDG 9. The paper highlights that to build a more sustainable future, it is essential for industries to adopt a decisive transition towards a circular economy, with material cycles free of toxic substances and a carbon-neutral balance, in line with the Paris Agreement. Such a model will protect biodiversity and ecosystems, address climate change, pursue the sustainability of agricultural and food systems and promote safe and sustainable low-emission energy sectors, as well as sustainable buildings and mobility systems, while strengthening European cohesion.
What is mainly emphasized in the paper is that the contribution of each citizen, who through their individual daily habits can positively contribute to the success of SDG 9, is of decisive importance for the achievement of goal 9.

Keywords: Agenda 2030, SDG 9, sustainable development, infrastructure, innovation, industry

Session 1: Measuring Circular Efficiency: From Policy Metrics to Consumer Impact

AN OVERVIEW OF PLASTIC POLLUTION IN THE ENVIRONMENT

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Abstract. Many people believe that we can simply stop using plastics. This is one of the most serious misconceptions, as plastics, in their various forms, are highly versatile materials: easy to use, inexpensive, and deeply embedded in modern society. The reality is that we will never completely stop using plastics. In fact, more than 90% of consumer products are purchased in plastic packaging. Plastics are present across almost every sector, including agriculture, medicine, food and beverage, aviation, automotive, robotics, telecommunications, the space industry, and many more. Global plastic production reached nearly 400 million metric tons in 2022, and according to Statista projections, plastic waste may exceed 1,100 million metric tons by 2060, making global reduction efforts extremely challenging. This paper highlights the urgent need to identify alternative circular solutions to conventional plastic production, focusing on bio-based materials, and to propose effective strategies for the management and treatment of plastic waste.

Keywords: micro plastics, nano plastics, environmental health impact, impact assessment, circular economy.

CIRCULAR ECONOMY IN SMART CITIES: TECHNOLOGY TRANSFER, INNOVATION AND THE ACTIVE ROLE OF CONSUMERS

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Abstract. This paper investigates the impact of key circular economy indicators on the ecological footprint in European countries with different levels of smart city development and their importance for consumers. The research was conducted using correlation and multiple regression analysis to determine which aspects of circularity most significantly shape the sustainability of urban systems. Secondary data from Eurostat were used for six circular economy indicators: recycling rate, non-mineral waste recycling, municipal waste generation, raw material consumption and total waste generated, which were considered as independent variables, while the ecological footprint was treated as the dependent variable. The results indicate that some circularity indicators have a statistically significant impact on the ecological footprint, with higher circularity generally leading to lower environmental burden and clearer guidelines for consumers. At the same time, the hypothesis of a positive impact of raw material consumption on the ecological footprint was rejected, suggesting that the effects of resource use are amortized through other structural factors or technological capacities of the countries studied. These findings contribute to a better understanding of the relationship between circular practices and urban sustainability in the context of smart city development and the role of consumers in these processes.

Keywords: circular economy, smart cities, technology transfer, innovation, consumer, Ecosystem.

CIRCULAR BIOECONOMY TO SUPPORT THE GREEN TRANSITION IN INSULAR AREAS

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Abstract. Insular regions face challenges such as energy deficit, a declining agricultural sector, deteriorating water and soil quality, a rise in the risk of natural disasters brought on by climate change, coastal pollution, ineffective biowaste management, deteriorating ecosystems, a loss of biodiversity, etc. Circular and resource-efficient economic models, which consider the entire material cycle to promote reuse as well as waste reduction and efficient resource utilization, are increasingly replacing linear economic models based on production-consumption-disposal systems. A bioeconomy covers a wide range of sectors and systems which are based on biological resources (animals, plants, microorganisms, and biomass, including organic waste), their functions and principles. The transition to circular bioeconomy will be further reinforced through the development and uptake of innovative technologies as well as the training of scientists and researchers through the collaborative ecosystem at national and international level. This paper presents the research infrastructure and two selected representative case studies developed within the framework of the Center for Sustainable and Circular Bioeconomy of the University of the Aegean (Aegean_BIOECONOMY).

The first case study investigates the cultivation of *Arthrospira* (Spirulina) *platensis* on diluted, non-sterile cheese whey, evaluating the effects of substrate concentration, pH and illumination on biomass production and nutrient consumption. The results show that alkaline conditions and light/dark photoperiods significantly enhance biomass productivity, while achieving high removal efficiencies for organic matter and nutrients, highlighting the feasibility of simultaneous wastewater treatment and biomass production. The second case study examines the production of bioplastics (polyhydroxyalkanoates - PHAs) using mixed microbial cultures under long-cycle feast–famine operation. Effective enrichment of PHA-storing microorganisms and substantial intracellular polymer accumulation were achieved, despite operational challenges related to sludge viscosity and aeration.

Overall, the findings demonstrate that biological valorization pathways can convert locally agro-industrial streams into value-added bioproducts, supporting resource efficiency, waste reduction and regional resilience. European bioeconomy and climate objectives.

Keywords: circular bioeconomy, island sustainability, research infrastructure, green transition, agro-industrial waste, bioplastics, cyanobacteria.

DATA - DRIVEN ASSESSMENT OF CIRCULAR ENERGY EFFICIENCY: AN EXPLAINABLE AI APPROACH

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Abstract. This paper presents an operational, closed-loop-inspired framework for assessing circular energy efficiency in district heating systems using real Supervisory Control and Data Acquisition (SCADA) data. Inefficiencies are characterized through regime-dependent "wastage signatures" (elevated supply/return temperatures, low ΔT, and control-induced mismatches). As a baseline of expected consumption for the Lamella L17 substation (Faculty of Mechanical Engineering, University of Nis), we train ensemble models - Random Forest and Least-Squares Boosting on time-aligned measurements (outdoor temperature, secondary-side supply temperature, and delivered heat), augmented with temporal features and short-horizon lags. Evaluation with a chronological train/test split shows that Random Forest provides the most robust performance (RMSE = 3.85, MAE = 1.67, R^2 = 0.894), particularly during abrupt regime changes. An explainability layer (permutation importance) is then applied to identify dominant drivers and flag high-deviation episodes as candidates for inefficient operation. The proposed workflow links baseline forecasting, interpretable diagnostics, and intervention-oriented feedback to support continuous efficiency improvement and more reliable heat delivery.

Keywords: district heating, circular energy efficiency, machine learning, explainable artificial intelligence.

SUSTAINABLE BIOSURFACTANT PRODUCTION FROM INDUSTRIAL WASTE USING *PSEUDOMONAS PUTIDA* ICCF 391: A CIRCULAR ECONOMY AND CONSUMER PROTECTION PERSPECTIVE

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Abstract. The transition toward circular and sustainable production systems has increased the need for biodegradable, non-toxic, and environmentally friendly compounds that can serve as alternatives to conventional synthetic chemicals. Microbial biosurfactants are a promising class of bio-based molecules that can facilitate this shift, particularly when produced using agro-food waste as a substrate.
In this study, the biosurfactant produced by *Pseudomonas putida* ICCF 391 was synthesized using a cost-effective mixed substrate consisting of glycerol (3%) and waste cooking oil (2%), effectively incorporating waste valorization into the bioprocess. Its physico-chemical stability was assessed over a broad range of temperatures (30-115 °C) and pH values (2-12), while its antimicrobial activity was evaluated against *Pseudomonas aeruginosa* ATCC 9027. The biosurfactant exhibited thermal and pH stability, and demonstrated antibacterial activity, producing a 29 mm inhibition zone.
Beyond its functional properties, the study frames the biosurfactant within the framework of the circular economy, highlighting its potential to reduce waste, promote sustainable industrial practices, and enhance consumer protection through safer, biodegradable, and renewable alternatives to chemical surfactants. These findings support integrating biosurfactants into sustainable industrial systems and highlight their relevance to EU policy objectives on waste reduction, chemical safety, and consumer protection.

Keywords: microbial surfactant, *Pseudomonas* strain, industrial waste, circular economy.

UTILIZATION OF RECYCLED GLASS BOTTLES IN CEMENT PRODUCTION: A SUSTAINABLE APPROACH FOR WASTE MANAGEMENT AND CONSTRUCTION PRACTICES ON LESVOS ISLAND

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Abstract. In recent years, sustainable construction practices have gained importance due to their potential to reduce environmental impact. This study explores the use of pulverized glass as a pozzolanic material in cement production, particularly focusing on its properties, applications, and environmental benefits on Lesvos Island. The research indicates that utilizing recycled glass can not only improve the mechanical properties of concrete, but also significantly lower carbon dioxide emissions associated with traditional cement production. This study assesses the effectiveness of integrating pulverized glass into cement mixtures, providing a viable solution for local waste management and contributing to the circular economy. The findings underscore the potential for this practice to enhance sustainable development in the region, promoting local economic growth while addressing environmental challenges.

Keywords: fine aggregate, sand replacement, pozzolanic reactivity, cement.

PERCEPTION OF BRAND HUMANIZATION BY UNIVERSITY STUDENTS: DEVELOPMENT AND TESTING OF THE MEASUREMENT SCALE

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Abstract. This article explores how social and green values contribute to the humanization of university brands as perceived by students, addressing a gap in higher education branding research. As universities seek to build emotionally resonant and ethically grounded identities, the study focuses on operationalizing two key dimensions – social and environmental responsibility – within a brand humanization framework. The authors developed a measurement instrument grounded in the University Social Innovation Management (USIM) model. The instrument included 18 items assessing students' perceptions of socially and environmentally responsible practices across education, operations, and stakeholder engagement. A pilot study involving 42 Latvian university students was conducted to test the internal consistency and conceptual validity of the scale. Findings indicate that social value indicators, like inclusive infrastructure, internal stakeholder engagement, and communication of social impact – are perceived as central to a humanized university brand. In contrast, green values, are seen as secondary and gain relevance only when visibly enacted through infrastructure or policies. The scales demonstrated strong internal reliability, and the moderate correlation between the two subscales supports their theoretical interconnection. The study contributes a validated tool for assessing value-based brand humanization in higher education and offers insights for universities aiming to strengthen brand authenticity, student engagement, and stakeholder trust. These findings highlight the importance of making both social and environmental commitments visible and relatable to students and lay the groundwork for further cross-cultural studies in higher education branding.

Keywords: brand humanization, university brand perception, social values, green values, pilot study.

FRAMEWORK FOR CONSUMER-CENTRIC CIRCULARITY – THE LOCAL SYMBIOSIS INDEX LINKING INDUSTRIAL COOPERATION TO REDUCING, REUSING, AND REPAIRING

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Abstract. National circular economy (CE) monitoring frameworks provide essential comparability, yet they rarely capture the local governance network maturity that determines whether consumers can access practical circular options such as repair, reuse, and refurbishment. This study introduces the Local Symbiosis Index (LSI), a governance-oriented, open-data composite indicator designed for municipal-scale assessment of industrial symbiosis and territorial circular cooperation as enabling conditions for fair circular market outcomes. The LSI is constructed exclusively from published, verifiable sources (public project databases, industrial emissions/transfer datasets, procurement records, and municipal documents) using explicit eligibility, scoring, and exclusion rules to ensure auditability and replicability in data-constrained settings. The index integrates four dimensions: (1) formalized CE partnerships, (2) resource exchange intensity using published transfer proxies, (3) joint CE initiatives involving local governments, and (4) public institutional support mechanisms. Raw criterion measures are normalized to a common scale, aggregated with transparent baseline weights, and tested through sensitivity analysis under alternative weighting schemes to evaluate robustness. A pilot application to the City of Niš (Serbia) yields an LSI score of 51/100, indicating intermediate local symbiosis maturity characterized by relatively stronger governance integration and institutional support than documented exchange diversity. The findings show the feasibility of municipal CE governance benchmarking using open evidence and show how sub-scores can pinpoint actionable bottlenecks, such as weak partnership formalization or limited exchange-relevant flow diversity, that constrain the emergence of repair and reuse ecosystems.

Keywords: local symbiosis index; industrial symbiosis; circular economy governance; resource management; consumer protection.

HETEROGENEOUS PATHWAYS TO CIRCULAR MATERIAL USE IN EUROPE: COUNTRY CLUSTERS, CONSUMPTION-RELATED OUTCOMES, AND CONSUMER IMPLICATIONS

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Abstract. Circular economy (CE) has become a central pillar of the European Union's sustainability agenda; however, substantial differences in CE performance persist across Member States, raising the question of whether similar outcomes are driven by comparable underlying mechanisms. Existing empirical assessments largely rely on aggregated indicators or uniform analytical frameworks, implicitly assuming common driver structures across countries and thereby overlooking structural heterogeneity as well as consumption-related dynamics.

Using harmonized Eurostat data covering the period 2014–2023, this study examines the drivers of circular material use in Europe through a heterogeneity-aware analytical framework. The Circular Material Use Rate is treated as the outcome of interest and interpreted as a macro-level proxy for consumption-related circular outcomes, reflecting the extent to which secondary materials are absorbed into final use. A Naive Bayesian Network is first employed to identify indicators exerting direct influence on circular material use under a transparent conditional independence assumption. This framework is subsequently extended using a Tree-Augmented Naive Bayes structure, allowing indirect and mediated influence pathways among indicators to be explored. To explicitly capture cross-country heterogeneity, countries are further grouped via cluster analysis based on their circular material use trajectories, and the network analysis is repeated within each cluster.

The results show that while certain indicators exert systematic influence on circular material use at the aggregate level, both the strength and configuration of direct and indirect relationships vary substantially across country groupings. Economically stronger countries exhibit consumption-related effects that are largely mediated through material efficiency, trade in secondary raw materials, and circular economy investments, whereas less mature systems display more direct associations with waste generation, recycling performance, and consumption intensity. These findings indicate that similar circular material use outcomes can arise from structurally distinct combinations of economic, material, and waste-related factors.

Keywords: cluster analysis, circular economy, consumer-related outcomes, naive Bayesian network, tree-augmented Bayesian Network, Eurostat Data.

MEASURING CONSUMER-CENTRED CIRCULAR ECONOMY IN HORIZON EUROPE: PORTFOLIO ANALYSIS OF PROJECTS WITH CROATIAN PARTICIPATION

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Abstract. The circular economy has become a central pillar of the European Green Deal and EU consumer-protection agenda, linking resource efficiency with safer, more durable and repairable products. The ECO4ALL COST Action promotes a circular economy that explicitly "works for consumers". This article analyses 20 Horizon Europe projects with Croatian participation (start date ≥ 1 January 2024) that are thematically related to the circular economy and consumer issues. Using CORDIS data, projects were coded into thematic categories, sectoral focus and a three-level Consumer Relevance Index. The portfolio is dominated by bio-based materials, bioeconomy and resource management, with smaller representation of sustainable consumption initiatives. Overall, 40% of projects display high and 40% medium consumer relevance, but explicit attention to repair, product longevity, legal enforcement of consumer rights and systematic measurement of consumer outcomes remains limited. Croatian actors are well positioned within interdisciplinary circular-economy research, while gaps highlight opportunities for future projects integrating consumer law, repairability and behavioural insights aligned with ECO4ALL objectives.

Keywords: circular economy; consumer protection; Horizon Europe; Croatia; sustainable consumption; research portfolio analysis; ECO4ALL.

MEASURING CIRCULAR PERFORMANCE: A COMPOSITE INDEX FOR ORGANIZATIONAL SUSTAINABILITY

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Abstract. The transition to a circular economy requires reliable tools to assess organizational performance. This paper develops a Circular Performance Index (CPI) that integrates financial, operational, environmental, and social indicators into a single metric. Indicators are normalized and aggregated using multi-criteria methods, with weights derived from the Analytic Hierarchy Process. A case study in the energy equipment manufacturing sector demonstrates CPI's practical application. Robustness is evaluated through sensitivity analysis at both dimension and indicator levels. Results indicate that the CPI remains stable under reasonable perturbations, with explicit procedures for missing data and uncertainty propagation further supporting its reliability. This stability supports its use for benchmarking, and strategic decision-making.

Keywords: circular economy, composite indicators, sustainability performance, multi-criteria decision analysis.

Session 2: Designing for Longevity: Innovations and Best Practices in Circular Product Design

THE CIRCULAR ECONOMY IMPERATIVE: SYNERGISTIC EFFECTS OF MODULARITY, DISASSEMBLY, AND RECYCLABILITY IN PRODUCT DESIGN

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Abstract. The transition to a circular economy fundamentally depends on product design innovations prioritizing three critical pillars: modularity, easy disassembly, and recyclable materials. This paper argues that these pillars are essential to break away from linear "take-make-dispose" models and demonstrates that their effectiveness depends on synergistic integration rather than isolated implementation. Unlike existing circularity metrics (Material Circularity Indicator, Overall Circularity Effectiveness, 9R Index), which employ additive weighted sums—allowing weak performance in one dimension to be compensated by others—this research introduces a Circular Effectiveness Index (CEI) using multiplicative logic, where pillar interdependence creates non-compensatory threshold effects. When any single pillar approaches zero, the system's circularity collapses, regardless of excellence in other dimensions.

Through comparative case study analysis across consumer electronics (Fairphone), textile engineering (Polyamide 6 mono-material systems), and furniture design (glue-free assembly), we demonstrate significant synergistic effects when all three pillars are simultaneously optimized. A critical finding reveals that when disassembly feasibility falls below minimum thresholds, recycling infrastructure becomes economically non-viable regardless of material composition. The framework operationalizes core consumer rights—right-to-repair, right-to-information, and right-to-sustainable-products—by demonstrating how design architecture enables or constrains consumer agency in circular systems. CEI provides manufacturers and policymakers with systematic methodology for evaluating design decisions and prioritizing interventions with highest circular impact.

Keywords: circular economy, modularity, design for disassembly, recyclable materials, product lifespan, sustainable design.

REUSABLE LOGISTICS UNITS IN RAIL TRANSPORT: CIRCULARITY "BEYOND THE PRODUCT" AND EFFECTS ON THE TOTAL COST TO THE CONSUMER

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Abstract. The transition to a circular economy in logistics chains involves extending circularity "beyond the product" to include packaging and reusable logistics units (pallets, crates, containers, etc.). This article examines how the reuse of these units in rail transport contributes to reducing waste and externalities, while improving logistics performance and generating benefits for consumers (such as lower final prices, better quality and increased transparency). After reviewing recent literature (2018–2025) on the circular economy in logistics, returnable packaging and the role of rail transport in sustainability, we propose a conceptual model linking the use of reusable logistics packaging to supply chain efficiency and consumer outcomes. Methodologically, we use a total cost of ownership (TCO) modelling approach and comparative scenarios (road vs. rail, single-use vs. reusable packaging). The conceptual results suggest that a scenario combining rail transport with reusable packaging can reduce total logistics costs and emissions compared to traditional linear scenarios, although the effect on the final price depends on the mechanisms for passing on savings to the market. We discuss the mechanisms by which packaging reuse (e.g. reduced cycle costs, increased operational efficiency and lower environmental taxes) can translate into benefits for consumers – but also the risks and challenges (return costs, packaging losses, strict hygiene requirements, the need for standardisation and avoiding greenwashing). The article offers implications for rail transport and logistics operators (regarding circular business models and chain cooperation), for decision-makers (regarding policies to encourage reuse and transparency) and for consumers (protection of rights and access to information on sustainability). The conclusions highlight the need for multi-stakeholder partnerships and coherent policies to fully exploit the potential of reusable packaging in rail transport, along with operational recommendations and directions for future research, including conceptual adaptation to case studies on cross-border rail corridors in Eastern Europe.

Keywords: circular economy; returnable packaging; rail transport; total cost of ownership (TCO); logistics performance; consumer protection; transparency.

FROM WANTING LESS TO DESIGNING LESS

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Abstract. The rising environmental challenges and the trend of constantly increasing consumption have highlighted the weaknesses of the prevailing sustainability strategies based primarily on the efficiency and circularity approaches. Recently, sufficiency has emerged as another sustainability strategy that tackles the problem of consumption by reframing the "enough" boundary related to human well-being. The concepts of sufficiency have been examined both in the area of consumer behavior and the field of sustainability business modeling, but both lines of research have developed comparatively independently and have contributed very little to understanding the interplay of demand and supply sides in sustainability transitions.

The current paper helps to fill the existing gap by conducting a systematic review literature on consumption behavior and business models based on the concept of sufficiency. According to the PRISMA 2020 protocol, the current review will compile the findings from 37 peer-reviewed articles published mainly in the Scopus database from the year 2000 to 2025. The results indicate that the concept of sufficiency on the consumer side has been mainly represented by transformations in values, identities, and practices, wavering between voluntary consumption and forced behavior due to structural necessity. The concept on the other hand has been defined by approaches such as durability design, product repair and reuse, sharing, and rationing, among others, mainly limited by the logic of growth.

The analysis shows there is an ongoing tension between the consumer goal of sufficient consumption and the organizational goal of increased consumption that strongly constrains the transformative potential of sufficiency if considered alone as a transformational issue. By combining the insights of consumer and organizational studies, this review contributes to the study of sufficiency by seeing it as an issue of socio-technical transformation that is relational rather than singular and consumer-based. The implications of the study show the requirement of changes that involve the development of sufficiency as a legitimate and scalable route to wellbeing.

Keywords: sufficiency, sustainable consumption, sufficiency business models, sustainability transition, circular economy.

CONSUMER PROTECTION AND THE LONGEVITY OF NANOMATERIALS BLENDED ULTRAFILTRATION MEMBRANES FOR CIRCULAR WATER SYSTEMS

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Abstract. The development of closed loop water system technology, which is treated water is continuously recycled within a defined system boundary, requires advanced treatment methods guaranteeing high quality treated water. Polymeric ultrafiltration membranes are widely used for water recovery. Nevertheless, their lifespan is often restricted by fouling resistance and hydraulic resistance. In this paper, nanomaterials-blended UF membranes incorporating nano sized zinc oxide (nZnO) and carbon nanotubes (CNTs) were comparatively examined regarding their suitability for closed loop water systems from performance and consumer protection points of view.

The incorporation of 2 wt% nZnO increased membrane porosity from 0.43 to 0.48 and flux from 54 to 58 L m^{-2} h^{-1}. The solute rejection improved from 81% to 87% and hydraulic resistance decreased from 17 × 10^8 to 15 × 10^8 m^{-1}. On the other hand, the addition of 1 wt% CNT resulted in an increase in flux from 25 to 100 L m^{-2} h^{-1}, and improved rejection of from 44% to 80%. The hydraulic resistance decreased from 13 × 10^{12} to 11 × 10^{12} m^{-1}. These results indicate performance enhancement by improving pore uniformity with nZnO, and by pore connectivity with CNTs.

From the perspective of consumer protection, both nanomaterial systems show improved stability and lower hydraulic resistance, which are essential for long-term operation within water reuse systems. CNT blended membranes show considerable performance advantages with low additive concentration. Overall, this study has shown that nanomaterials blended ultrafiltration membranes have the capability to perform well within circular water systems if designed taking into consideration efficiency as well as consumer protection.

Keywords: CNT, nZnO, ultrafiltration, consumer protection, nanomaterials, water treatment.

DESIGNING FOR LONGEVITY AND CONSUMER PROTECTION: INTEGRATING EYE TRACKING AND QUALITY FUNCTION DEPLOYMENT IN CIRCULAR PRODUCT DESIGN

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Abstract. Designing products for longevity, reparability, and transparency is central to the transition towards a circular economy. While Quality Function Deployment (QFD) offers a structured approach to translating customer requirements into engineering specifications, its reliance on self-reported preferences limits its ability to capture implicit user priorities, particularly regarding sustainability. This paper proposes a behaviourally informed design framework that integrates eye-tracking analysis into QFD to support circular product design. Eye tracking provides objective evidence of user visual attention to longevity-related design cues, such as modularity, repairability indicators, material transparency, and eco-labels. These behavioural insights are systematically embedded into the House of Quality to strengthen the prioritization of circular design features. The paper develops the Behaviourally Informed QFD Framework for Circular Product Longevity and illustrates its practical application. The framework bridges the gap between technical design decisions, policy requirements, and user perception, enhancing product longevity and consumer empowerment.

Keywords: QFD, EYE tracking, system integration, circular product design.

TARGET AREAS FOR CLIMATE ACTION VIA URBAN CIRCULAR BIOECONOMY IN IRELAND: BUILT ENVIRONMENT, FOOD, MANUFACTURING, TRANSPORT LOGISTICS, AND PEOPLE

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Abstract. The work summarised in this paper was undertaken to deliver a fast-track to policy report for the Irish Government and local authorities. The objective was to identify readily adoptable climate change mitigation opportunities in the context of urban circular bioeconomy. The circular economy and bioeconomy are central to delivering climate action and resource efficiency as part of the EU Green Deal. Cities and urbanised areas have an important role in this context, given their densities and scale, in terms of people, businesses, high levels of resource consumption and waste generation. The initial review of evidence indicated that actions could most effectively be structured under five themes: (1) circular built environment, (2) circular food system, (3) circular manufacturing, (4) transport and logistics and (5) uptake of circular consumer goods. Implications for Ireland were identified based on literature, and example case studies that could be put into action quickly, with a high chance of success were identified. These were focusing on timber (built by nature), joining the organic cities network, optimising local supply chains, zero emissions logistics and utilising toolkits for resource management in local authorities. It was concluded that there is great potential for Ireland to rapidly adopt case studies developed in the European Union to achieve climate mitigation through urban circular bioeconomy.

Keywords: urban circular bioeconomy, climate action, target areas.

CIRCULAR ECONOMY PERFORMANCE IN THE EUROPEAN UNION: DISPARITIES, TRENDS, AND THE RELATIONSHIP BETWEEN RESOURCE PRODUCTIVITY AND CIRCULAR MATERIAL USE

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Abstract. The transition toward a circular economy is a central priority of the European Union, as outlined in the Circular Economy Action Plan under the European Green Deal. Achieving this transition requires systematic measurement and monitoring of circularity and resource-efficiency indicators, with Eurostat providing the core metrics used to track progress. The objective of this study is to assess circular economy performance across EU Member States by analysing three key indicators: Circular Material Use, Domestic Material Consumption, and Resource Productivity for the EU-27 over the period 2015–2024, focusing on long-term trends, disparities, and the relationships among them.

Descriptive statistics and trend analysis show modest improvements in circularity, slight reductions in material output, and substantial gains in resource productivity. One-way ANOVA confirms statistically significant differences between Member States for all three indicators, with Northern and Western countries demonstrating higher circularity, led by the Netherlands, while several Southern and Eastern members remain reliant on high levels of virgin material consumption. Pearson correlation analysis shows a strong positive association between Circular Material Use and Resource Productivity and a negative relationship between Domestic Material Consumption and both Circular Material Use and Resource Productivity. A simple linear regression further shows that Circular Material Use is a significant predictor of Resource Productivity, with each additional percentage point of Circular Material Use increasing Resource Productivity by 0.134 €/kg.

The findings highlight the uneven progress of circular transitions across the EU and underscore the implications for consumer protection, as high material intensity is associated with higher environmental pressures and lower access to durable, repairable, and sustainable products.

Keywords: circularity metrics, domestic material consumption, statistical analysis, regression, consumer protection.

TRANSPOSITION OF EUROPEAN APPROACHES IN GEORGIA: THE WASTE MANAGEMENT CODE, EXTENDED PRODUCER RESPONSIBILITY (EPR) AND THE CIRCULAR ECONOMY

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Abstract. The paper examines development dynamics of Georgia's waste management system, focusing particularly on the introduction and implementation of the Extended Producer Responsibility (EPR) instrument within the context of the EU-Georgia Association Agreement. The study reviews the legal and institutional framework for waste management that was established after the Waste Management Code was adopted, and assesses how well it aligns with European Union environmental standards. The paper analyses the main types of waste produced in Georgia, including municipal, hazardous, medical, inert, construction and other specific types of waste, and identifies the key challenges facing the system, such as the lack of infrastructure for separate collection and recycling.

This desk research study includes an analysis of legislative and regulatory acts, strategic policy documents, official statistical data and relevant reports, complemented by expert interviews. Particular attention is paid to assessing the performance of Extended Producer Responsibility organization operating in Georgia, based on data from 2023-2024. The findings suggest that implementing the EPR system has led to a significant rise in the collection and recycling of certain waste streams, particularly tires, oils, batteries and accumulators, and waste electrical and electronic equipment.

However, the paper also identifies several structural and practical challenges, including delayed enforcement of regulations governing certain waste streams, such as packaging waste and end-of-life vehicles; misalignment of interests between businesses and municipalities; and limited analytical capacity of existing waste management information platforms. The study concludes that EPR is a vital policy tool for improving Georgia's waste management system; however, to enhance its effectiveness, it must be strengthened.

Keywords: Georgia, waste management, extended producer responsibility, circular economy.

INTEGRATING ENVIRONMENTAL AND CONSUMER METRICS TO UNDERSTAND SUSTAINABLE PURCHASING BEHAVIOR: INSIGHTS FROM CIRCULAR ECONOMY PRACTICES

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Abstract. The adoption of Circular Economy (CE) practices is increasingly recognised as a key driver of both environmental sustainability and business value creation. Consumers are increasingly aware of and appreciate eco-friendly products, which may influence their buying behaviour and create opportunities for businesses to align sustainability initiatives with market expectations. By implementing eco-friendly strategies - ranging from resource-efficient production and waste reduction to the use of durable and recyclable products - companies can engage these consumers and gain a competitive advantage. The aim of this research is to examine the extent to which perceived environmentally responsible practices influence consumer behaviour, specifically their intention to recommend and pay premium prices for products or services offered by companies implementing CE principles. To explore these relationships, the study integrates environmental metrics – key performance indicators reflecting consumers' perceptions of micro-level sustainability practices - with consumer behaviour metrics capturing their positive purchase intentions. Data were collected through a structured questionnaire, and 572 valid responses were analysed using Structural Equation Modelling (SEM). The results indicate that while perceived CE practices show a positive association with consumer intentions, the effect sizes remain modest, highlighting the complexity of sustainable purchasing behaviour and the persistence of the intention–behaviour gap. Nevertheless, the findings provide relevant insights for companies seeking to align sustainability initiatives with market expectations. By understanding how consumers perceive and evaluate environmentally responsible practices, businesses can more effectively design strategies that support sustainable market transitions and foster broader adoption of CE principles.

Keywords: circular economy, consumer purchasing behaviour, environmental practices; structural equation modelling.

CIRCULAR EFFECTS OF SUSTAINABLE PRODUCTION AND CONSUMPTION ON ENVIRONMENTAL QUALITY: A CROSS-COUNTRY MEDIATION ANALYSIS

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Abstract. This study examines how circular economy solutions in sustainable production and consumption practices influence environmental quality across European countries and Türkiye. The analysis draws on harmonized data from the Flash Eurobarometer 2024 survey and the National Footprint and Biocapacity Accounts (2025 Edition) to assess how green market support mediates the relationship between circular practices and environmental impact, measured by the ecological footprint. Results from the mediation analysis reveal a positive association between resource efficiency practices and green market support regarding the production of the environmentally responsible product/service sector among these small businesses. Moreover, countries with more advanced green markets also have lower ecological footprints. Notably, it is clear that production contributions to pressures on the natural environment are made statistically non-significant when green market support serves as a mediator to contribute to these pressures, among other production practices, since it underscores the complementary nature between production and consumption practices aimed at developing a circular economy that benefits the natural environment. The findings highlight key interactions between production and consumption practices that collectively support environmental sustainability within a circular economy framework.

Keywords: circular economy, green markets, SMEs, Flash Eurobarometer survey, ecological footprint, European countries, Turkey.

DESIGN FOR REUSE AND LONGEVITY OF CIRCULAR CONSTRUCTION PRODUCTS

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Abstract. The transition to a Circular Economy (CE) in the built environment requires a paradigmatic shift from linear "take-make-dispose" consumption to models that prioritize resource longevity. Design for Longevity (DfL) and Design for Reuse (DfRe) are cornerstone strategies, but their practical implementation is hindered by a lack of unified tools for early-stage design. This paper addresses this gap by first synthesizing the core technical principles (Design for Disassembly, Adaptability, Modularity) that underpin circular construction.
The primary contribution is the development of a novel multi-criteria tool, the "DfLRe assessment system," designed to inform early-stage decision-making. Based on expert surveys, the system evaluates construction products against seven key criteria and ranks the façade systems. This DfLRe system is applied to four common timber façade (TF) typologies. The results reveal critical trade-offs in choosing most suitable products, as the highest-ranking façade system demonstrated poor reusability, while the lowest-carbon option had high maintenance needs. The paper concludes that longevity is not an intrinsic material property but a systemic outcome. The DfLRe framework provides a practical tool for designers to navigate these complex compromises, enabling more informed decisions to slow and close resource loops.

Keywords: construction products, circular design, design for disassembly (DfD), design for reuse (DfRe), modular construction, multi-criteria assessment.

Session 3: Aligning Law and Design: Policy and Regulatory Pathways for a Fair Circular Transition

BRIDGING CONSUMER PERCEPTIONS AND CIRCULAR ECONOMY EFFICIENCY: EVIDENCE FROM A POST-TRANSITION EU ECONOMY

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Abstract. Despite strong policy commitments to the circular economy (CE) at the European Union level, many post-transition economies continue to exhibit weak implementation outcomes. This paper examines circular economy inefficiency from a consumer-centered perspective, responding directly to the ECO4ALL conference focus on reducing, reusing, repairing, and protecting consumers in circular systems. Drawing on a nationally stratified survey of 629 adults in Bulgaria, the study analyzes seven interrelated domains: awareness, behavioral practices, motivation, institutional trust, social norms, policy understanding, and economic attitudes. The findings reveal that while intrinsic environmental values are relatively strong, consumer understanding of CE remains narrow and predominantly recycling-oriented. Participation in circular practices is uneven, with repair and recycling more common than sharing or second-hand consumption. Structural barriers, weak policy communication, affordability concerns, and low institutional trust significantly constrain consumer engagement. The paper argues that CE inefficiency emerges from the interaction of cognitive, institutional, and economic constraints across micro, meso, and macro levels. It concludes that consumer-oriented policy design, transparent governance, and targeted economic incentives are essential for improving CE performance in post-transition contexts.

Keywords: circular economy, consumer behavior, institutional trust, policy communication, sustainable consumption.

BEYOND THE GREEN DEAL: A COMPARATIVE ANALYSIS OF CIRCULAR ECONOMY TRANSITIONS IN THE VISEGRAD GROUP AND BALTIC STATES

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Abstract. The European Green Deal mandates a structural shift from linear to circular economic models, presenting unique challenges for the post-socialist economies of Central and Eastern Europe. This paper provides a state-of-the-art comparative analysis of Circular Economy (CE) regulations and performance in the Visegrad Group (V4: Czechia, Hungary, Poland, Slovakia) and the Baltic States (Estonia, Latvia, Lithuania). Utilizing a mixed-methods approach that combines qualitative legislative review with quantitative analysis of 2023–2024 Eurostat data, the study reveals a divergent "dual-speed" transition. While the Baltic states, particularly Lithuania and Estonia, are leveraging digital governance and aggressive eco-taxation to drive upstream circularity, the V4 nations face significant industrial "lock-in", relying heavily on downstream waste management solutions like incineration. The results highlight a critical paradox: some nations achieve high municipal recycling rates (e.g., Slovakia, Latvia) yet fail to reintegrate secondary materials into the economy (low Circular Material Use Rate), suggesting a "recycling trap". The paper concludes with region-specific policy recommendations to bridge the gap between compliance and genuine circularity.

Keywords: circular economy, Visegrad group, Baltic States, waste management, European Green Deal, eco-innovation.

SEGMENTED LIABILITY IN ONLINE LEGAL ADVICE: A RECONCEPTUALIZATION OF RESPONSIBILITY TOWARD THE DIGITAL CONSUMER

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Abstract. The accelerated digitalization of legal services has profoundly reshaped the way legal information is produced, accessed, and perceived by users. Online platforms have become, for an increasing number of individuals, the primary point of access to legal consultancy. Within this emerging ecosystem, users, often positioned as digital consumers lacking critical evaluative resources, are exposed to new forms of legal risk generated by asymmetries of expertise and by the opacity of algorithmic mechanisms that influence content visibility and perceived credibility. In this context, classical models of civil liability centered on the author–user relationship prove inadequate to explain the emergence of harm in digital environments. This paper advances a segmented liability model grounded in the interaction between the author of legal content, the digital platform, and the algorithmic architecture, each contributing in a distinct manner to the formation of legal risk. The study adopts a comparative perspective, examining the regulatory frameworks of Romania and the Republic of Moldova. It highlights the transformative role of the Digital Services Act and demonstrates that legal harm may arise not only from human error, but also from algorithmic mechanisms of automated validation and dissemination of information. The segmented liability model offers an analytical framework capable of integrating civil law principles with European digital governance and of supporting a preventive approach to technological risks. The conclusions emphasize the model's potential to inform future doctrinal and legislative developments concerning legal responsibility in digital environments, particularly within the Eastern European legal space.

Keywords: online legal advice, segmented liability, digital consumer, digital platforms, algorithms, Digital Services Act (DSA), legitimate trust.

A MIND MAP OF FACTORS INFLUENCING THE CHOICE OF ECO-FRIENDLY AND SUSTAINABLE PRODUCTS: INSIGHTS FROM NEUROMARKETING

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Abstract. Neuromarketing evaluates human expressions to understand people's behavior, and marketing can exploit the main factors associated with each behavior to help individuals make more conscious and environmentally friendly decisions. The decision-making process is complex, but through emotional responses to experiences (products or advertisements), communication can be more assertive if it considers consumer perception. Attractive eco-friendly packaging and messaging, innovative design, and consumer-centred marketing strategies can influence the decision to purchase eco-friendly and sustainable products, especially when they take into account the level of awareness of perceived value among consumers and buyers. Despite considerations (rational, emotional, and associated risks), can people see the same product differently? To answer this question, the objective of this research was defined: to develop a comprehensive understanding of the factors that influence the consumer decision-making process. On November 27, 2025, this research develops a literature review in Web of Science Core Collection, searching article related to Neuromarketing, to understand the decision-making process of consume, which can be applied to the eco-friendly and sustainable products campaign. The results structured the factors into five dimensions, and a map mind emerges from it.

Keywords: consumer behaviour, neuromarketing, sustainability, circular economy, social marketing.

GAPS AND MISALIGNMENTS IN POLICY IMPLEMENTATION OF CIRCULAR ECONOMY

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Abstract. This article examines the persistent gaps and misalignments in the implementation of circular economy (CE) policies across EU Member States, despite the existence of a comprehensive EU-level regulatory and strategic framework. Drawing on the European Green Deal, the 8th Environment Action Programme, and the Circular Economy Action Plan, the study evaluates how legislative, institutional, and economic factors shape national performance. Using the EU Circular Economy Monitoring Framework as a reference point, the analysis focuses on low-performing Member States to identify structural obstacles such as delays in transposing EU directives, insufficient enforcement capacity, weak inter-agency coordination, limited investment, skills shortages, and inadequate consumer awareness. The findings show that policy adoption often outpaces operational readiness, with implementation gaps most apparent in waste management, material productivity, recycling infrastructure, and secondary raw materials markets. Additionally, small or import-dependent economies face scale constraints that inhibit the development of circular value chains. The article argues that achieving EU-wide CE objectives requires not only harmonised legislation but also enhanced administrative capacity, robust monitoring systems, targeted financial instruments, and a stronger integration of CE into industrial, labour, and fiscal policies. Ultimately, the analysis highlights that the CE transition is as much a governance challenge as it is an environmental and economic imperative.

Keywords: circular economy, policy implementation, sustainable transition, institutional capacity.

CIRCULAR POLICY FRAMEWORK IN THE FOOD SECTOR FOR BRIDGING REGULATION BUSINESS PRACTICES AND CONSUMER PROTECTION IN THE REPUBLIC OF NORTH MACEDONIA

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Abstract. The transition towards a circular economy in the food sector of the Republic of North Macedonia requires a coherent policy framework capable of bridging regulatory requirements, business practices and consumer protection. This paper examines how existing regulatory instruments influence the adoption of circular strategies within agri-food companies, building upon prior national and regional research on circular economy models. Based on an empirical study conducted among food sector enterprises, the research explores the gap between regulatory knowledge and actual business practices, with particular emphasis on packaging eco-design, bio-waste management and the role of digital technologies. The analysis identifies key structural and economic barriers that hinder circular strategy adoption, while also examining the role of the business sector in informing consumers and strengthening transparency as an integral component of consumer protection. The findings provide policy-relevant insights for improving support mechanisms, enhancing regulatory coherence and facilitating the green transition of the agri-food sector in line with European Union standards and the Green Agenda for the Western Balkans.

Keywords: circular economy, food sector, regulation, business practices, consumer protection, North Macedonia.

INFLATION TARGETING, CONSUMER BEHAVIOUR, AND SUSTAINABLE CONSUMPTION: A COMPARATIVE PERSPECTIVE ON CENTRAL AND EASTERN EUROPE

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Abstract. This paper examines how inflation targeting regimes correspond to consumer behaviour and sustainable consumption patterns in four Central and Eastern European countries: Romania, Poland, Hungary, and the Czech Republic. While inflation targeting is widely used to stabilise prices and guide expectations, its implications for household decision-making remain insufficiently explored, particularly in the context of Europe's transition toward circular and sustainability-oriented consumption.

Using a descriptive comparative approach for the period 2005–2024, the study analyses trends in inflation volatility, durable goods expenditure, repair and maintenance activity, and consumer confidence. The graphical evidence highlights how differences in monetary stability shape households' willingness to invest in long-lifespan products, engage in repair practices, and adopt forward-looking consumption strategies. The results suggest that stable and credible inflation targeting environments support more sustainable consumption behaviours by reducing uncertainty and enabling longer planning horizons. By contrast, higher inflation volatility and declining consumer confidence appear to shift households toward short-term, low-durability purchasing patterns, potentially weakening circular economy outcomes.

The study contributes to interdisciplinary research on monetary policy and sustainability by illustrating how macroeconomic stability conditions influence consumer choices related to durability and reparability. These insights may assist policymakers in strengthening the alignment between monetary frameworks, consumer protection, and circular economy objectives.

Keywords: inflation targeting, consumer behaviour, sustainable consumption, circular economy, Central and Eastern Europe, monetary stability.

THE RELATIONSHIP BETWEEN GOOD GOVERNANCE AND CIRCULAR ECONOMY PERFORMANCE IN THE EU

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Abstract. The European Green Deal, as the EU's new growth strategy, aims to transform Europe into a resource-efficient and circular economy with net-zero emissions by 2050. Within this framework, the circular economy stands as one of the key pillars for achieving sustainable growth. However, the circular transition is not only a technological or economic process but also an institutional one that depends on the quality of governance and regulatory capacity. This paper examines how governance performance relates to circular economy outcomes across EU Member States. Using indicators from the European Commission's Circular Economy Monitoring Framework and the World Governance Indicators, we assess whether dimensions of governance, particularly government effectiveness and control of corruption, are systematically associated with circular economy performance. The results from cross-sectional analysis indicate that countries exhibiting stronger governance performance generally tend to achieve better outcomes in circular economy practices. Evidence shows that higher levels of government effectiveness and stronger control of corruption are consistently associated with higher municipal waste recycling rates and, to a lesser extent, higher circular material use. These findings highlight the importance of the broader political and institutional environment as an enabling condition for the effective implementation of circular economy policies. Accordingly, we conclude that governments and policymakers should give more weight to improving institutional foundations of sustainability transitions to achieve carbon-neutral and circular economy targets set in European Green Deal.

Keywords: circular economy, governance quality, control of corruption, institutional economics, sustainable growth and development, international economics.

TURNING CIRCULAR FASHION AWARENESS INTO EVERYDAY PRACTICE: A MULTI-LEVEL ANALYTICAL FRAMEWORK

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Abstract. This article adopts a qualitative research design to examine how developments in the European Union's circular economy agenda intersect with circular fashion practices and consumer protection. It employs a multi-level analytical framework encompassing macro-, meso-, and micro-level dimensions. At the macro level, the study reviews EU strategies and regulatory instruments related to the circular economy and the textile and apparel sector; at the meso level, it examines circular design principles and emerging business models adopted by firms; and at the micro level, it considers consumer rights and the conditions that enable meaningful participation in circular practices.

The analysis is based on two complementary components. First, a document analysis of key EU policy texts, including the Circular Economy Action Plan and the EU Strategy for Sustainable and Circular Textiles, is conducted with particular attention to durability, repairability, reuse, consumer information duties, and lifecycle responsibilities. Second, these regulatory dimensions are used as an analytical lens to examine illustrative circular fashion initiatives implemented by leading European brands and widely documented international examples. Case selection draws on publicly available academic studies, policy reports, and organizational documentation addressing circular design features and consumer-facing tools such as eco-labels, digital transparency mechanisms, and repair or return options.

The findings identify recurring patterns and gaps in how regulatory expectations, design choices, and consumer engagement interact in practice. The article clarifies the position of circular fashion within the EU's evolving circular economy framework and offers policy-relevant and practice-oriented insights to support the translation of circular fashion awareness into everyday consumer behavior.

Keywords: circular fashion, circular economy, consumer awareness, consumer empowerment, sustainable fashion.

THE IMPACT OF CULTURAL CODES ON CIRCULAR ECONOMY EFFICIENCY IN THE CONTEXT OF SDG 12

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Abstract. This study examines the influence of cultural codes and behavioral factors on countries' achievement of SDG 12 (responsible consumption and production) as an integral component of the transition to a circular economy. While existing research largely emphasizes techno-economic drivers, this study highlights the overlooked role of cultural codes and value orientations. Using data from 78 countries, we apply a two-stage methodology combining multiple regression analysis with cluster analysis and Zhuravlev's discrete modeling algorithm to evaluate both the direction of influence and the structural significance of cultural indicators. The results reveal a robust and statistically significant negative relationship between SDG 12 achievement and key development and cultural indicators (such as individualism, long-term orientation), Human Development Index, and Global Innovation Index, suggesting that socio-economic progress and innovation often correlate with higher material footprints. Initial hypotheses expecting positive effects from individualism and long-term orientation were rejected. Cluster analysis identified three country groups based on SDG 12 scores. Testor analysis indicates that power distance, individualism, uncertainty avoidance, and long-term orientation are the most structurally important cultural factors differentiating countries within clusters. These findings underscore that cultural codes shape not only organizational environments but also consumption behaviors and societal readiness to adopt circular practices. Finally, achieving SDG 12 requires the synergy of institutional efficiency, technological solutions, and culturally anchored environmental responsibility.

Keywords: responsible consumption and production, circular economy, cultural codes, Hofstede's cultural dimensions, cluster analysis, regression analysis, circularity paradox.

Special Session 4 for Young Researchers: From Awareness to Action: Engaging Consumers and Businesses in Circular Practices

THE ROLE OF DIGITAL PLATFORMS IN ENABLING CONSUMER CIRCULARITY OF SMALL ELECTRONICS

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Abstract. Small electronics represent a critical yet underutilised source of raw materials essential for the European Union's green energy transition, with global collection and recycling rates below 10%. Despite strong policy commitments to circular economy principles, consumer participation in electronics circularity remains persistently low, driven by a significant intention–action gap between stated environmental concerns and actual circular behaviour. While digital platforms have emerged as potential enablers of consumer circularity through reduced transaction costs and enhanced accessibility, their effectiveness in converting behavioural intentions into sustained circular practices remains underexplored. This conceptual article synthesises literature on digital platforms, behavioural psychology and circular economy policy to address the research question: How can digital platforms be designed to address behavioural barriers and facilitate consumer participation in circular practices for small electronics? Drawing on the Theory of Planned Behaviour and meta-organisational orchestration frameworks, the article proposes the Behavioural Enablement Architecture (BEA), a multi-dimensional framework comprising perceived behavioural control enhancement, attitude reframing through environmental benefit communication, subjective norm activation and institutional alignment. The article contributes to circular economy literature by articulating how platforms and policies jointly shape consumer behaviour, by demonstrating the necessity of integrated multi-dimensional design, and by providing empirically grounded implementation guidance for policymakers and platform operators seeking to enable sustainable consumer engagement with small electronics circularity.

Keywords: circular economy, digital platforms, consumer behaviour, Theory of Planned Behaviour, small electronics.

DESIGNING SHARING AND CIRCULAR ECONOMY PLATFORMS WITH CULTURAL CONSIDERATIONS

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Abstract. This study investigates the influence of cultural factors on the design of sharing and circular economy platforms, particularly focusing on Community-Oriented Sharing Economy (COSE) as a beneficial form in this context when it comes to social, economic and environmental sustainability. Drawing on Hofstede's cultural dimensions theory, we analyze how cultural elements shape user participation, trust, and interaction within these digital ecosystems. Our goal is to identify design considerations for developing more inclusive and culturally sensitive platforms. Building on COSE platform affordances, we explore how five key affordances: generating flexibility, matchmaking, facilitating collectivity, trust-building, and extending reach, are interpreted and enacted differently across cultural dimensions. To do so, we conduct a literature review at the intersection of COSE and Culturally Sensitive Design in Human-Computer Interaction. Our analysis highlights how cultural dimensions such as individualism vs. collectivism, power distance, and uncertainty avoidance relate to user experience in the COSE context. Based on these insights, we propose a set of design considerations to enhance the cultural adaptation of COSE Platforms, aiming to strengthen user participation and trust. We argue that integrating cultural perspectives into platform design is essential for fostering more effective, equitable, and inclusive participation in the sharing and circular economies.

Keywords: cultural dimensions, culture, culturally sensitive design, circular economy, sharing economy platforms.

CORPORATE SUSTAINABILITY DUE DILIGENCE DIRECTIVE (CSDDD) IN PRACTICE: ANALYSIS OF OBLIGATIONS AND IMPLEMENTATION CHALLENGES

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Abstract. Nowadays, the importance of recognizing negative impacts on the environment is experiencing significant increase. There is a growing tendency for companies to harmonise their business activities with the principles of corporate sustainability, thus encouraging the development of a circular economy. In this regard, the EU is adopting the Corporate Sustainability Due Diligence Directive (CSDDD), thereby establishing a harmonised legal framework at EU level.

The paper analyses the provisions of the CSDDD through the principle of due diligence that companies should implement in their business operations, and the possible impacts of its implementation in practice. Given the shortcomings of the Directive's provisions in terms of monitoring the performance of companies, the EU responds to the excessive administrative burden foreseen by the CSDDD by adopting the Omnibus I package, which significantly narrows the circle of liable companies.

The paper provides a doctrinal and critical legal analysis, examining the importance of due diligence in corporate governance. It focuses on the main shortcomings in the implementation of the CSDDD, as well as the key elements of the Omnibus I simplification package, assessing whether it fulfils its purpose. After the analysis, the paper examines the limitations arising from the Omnibus I package, with an emphasis on increased thresholds for companies and the lack of strict regulation of civil liability. Based on these changes, the paper evaluates the consequences for effective corporate governance and the impact on consumer protection, providing practical guidelines for their quality implementation in practice.

Keywords: circular economy, due diligence, corporate sustainability.

ENGAGING CONSUMERS AND FIRMS THROUGH CIRCULAR BUSINESS MODELS: FROM AWARENESS TO SUSTAINABLE ACTION

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Abstract. The transition toward a circular economy requires not only technological and organizational innovation, but also active engagement of consumers and business partners. Although circular economy principles emphasize resource efficiency, reuse, and closed-loop systems, their successful implementation depends on how firms design business models that translate sustainability objectives into tangible value for users and stakeholders. In this context, circular business models represent a key mechanism for aligning environmental goals with market expectations and consumer behavior. Existing research indicates that awareness of circular economy principles does not automatically lead to adoption or long-term behavioral change. Instead, the transition from linear to circular practices is shaped by the interaction of communication strategies, business model adaptation, and gradual changes in consumer perceptions and routines. Business models therefore play a dual role by structuring value creation and capture while simultaneously influencing consumer engagement with products, services, and circular practices. Despite growing academic interest, the literature often treats consumer behavior, business model design, and communication mechanisms as separate domains. In addition, diffusion-of-innovation approaches tend to focus on consumer segments without explicitly considering the role of business model transformation in enabling mainstream adoption. This fragmentation limits understanding of how circular solutions move from early awareness to sustained use. To address this gap, this paper examines how circular business models engage consumers and firms across different stages of adoption. By integrating insights from circular economy research, business model frameworks, and diffusion-of-innovation theory, the study proposes a conceptual framework that supports the transition from awareness to sustainable action.

Keywords: circular business models, consumer engagement, business model innovation, adoption phases, diffusion of innovation.

FROM INDUSTRIAL CIRCULARITY TO WELL-BEING: ASSESSING THE SOCIAL EFFICIENCY OF THE CIRCULAR ECONOMY IN THE EU

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Abstract. This study investigates how effectively European Union Member States transform circular economy (CE) practices into social well-being, addressing a critical but underexplored dimension of circular transition research. While existing CE assessments primarily emphasize material flows, recycling performance, and resource productivity, far less is known about how circularity contributes to consumer-relevant and inclusive social outcomes.
Using an output-oriented Data Envelopment Analysis (DEA) framework under variable returns to scale, the study evaluates the social efficiency of CE across 27 EU countries, drawing on indicators of circular material use, material intensity, international recycling flows, self-perceived health, social inclusion, and real income. The results reveal substantial heterogeneity in social efficiency, showing that higher levels of circular activity do not automatically translate into stronger well-being outcomes for consumers.
Countries such as Denmark, Finland, Estonia, Ireland, Luxembourg, and Spain achieve full efficiency, indicating effective alignment between circularity practices, welfare structures, and socially inclusive outcomes. Conversely, several countries operate under decreasing returns to scale, suggesting that CE initiatives may dilute social effects and generate uneven distributional outcomes when implemented beyond their optimal capacity. Overall, the findings highlight the importance of policy coherence, institutional capability, and consumer-oriented governance in ensuring that circular economy strategies deliver inclusive and socially sustainable benefits.

Keywords: industrial circularity, social well-being, sustainable integration, consumer relevance, efficiency.

GENDER DIFFERENCES IN MOTIVATIONS TO CONSUME IN RESTAURANTS WITH A GREEN DIMENSION

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Abstract. Modern tourism is increasingly focusing on sustainable and environmentally responsible practices. A large part of the tourism industry is also occupied by public catering or restaurants. In the context of sustainable business, a special role is played by green restaurants as catering facilities that apply the principles of environmental protection, energy efficiency and the use of fresh local products in their business. The aim of this research was to examine the motivation of tourists for consumption in restaurants with a green dimension and to determine whether there are differences in motives between male and female respondents.

The research was conducted on the territory of the Republic of Serbia, with a special focus on Vrnjačka Spa as the largest spa tourist destination, in the period from August to October 2025. Data collection was carried out through a survey questionnaire with statements rated on a seven-point Likert scale. Statistical data processing included descriptive statistics and the non-parametric Mann–Whitney test to determine gender differences.

The results showed that respondents as a whole have a high level of motivation to consume in green restaurants, especially in terms of discovering local culture and new tastes. Statistically significant differences between the sexes were found in favor of women, who show a greater willingness to choose restaurants with an ecological dimension. These findings confirm the growing awareness of the importance of sustainable and circular tourism, as well as the need to further develop green gastronomic initiatives in Serbia's tourist offer. The obtained results contribute to the understanding of behavioral insights that influence the formation of sustainable consumer choices both in the field of gastronomic tourism and the wider dimensions of circular tourism and economy.

Keywords: green dimension, sustainable consumption, consumer motivation, green restaurants, behavioral insights.

A CONSUMER CYCLE FRAMEWORK FOR ASSESSING CIRCULAR ECONOMY PERFORMANCE AT THE USE PHASE

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Abstract. The transition towards a circular economy has become a priority of the European Union's regulatory agenda, with recent legislative initiatives increasingly targeting product durability and reparability at the consumption stage. Yet, existing monitoring frameworks remain largely focused on macro-level material flows and end-of-life indicators, offering only limited insight into whether these legal interventions translate, in practice, into economically viable repair options, longer product use, and tangible benefits for consumers.
This article addresses this gap by proposing a consumer-oriented monitoring framework, the Consumer Cycle Framework (CCF), designed to assess circular economy performance during the product use phase. The CCF introduces two complementary indicators: the Repair-to-Replacement Price Ratio, capturing the economic viability of repair relative to replacement, and the Market Value Retention Index, measuring the extent to which products retain economic value through secondary markets. These indicators allow for the identification of market frictions that continue to undermine circularity, such as high repair costs, limited access to spare parts, and rapid value depreciation, even where legal repairability requirements formally apply.
The implications of the CCF are twofold. First, it enables regulators and policymakers to assess whether circular economy measures produce economically sustainable outcomes for consumers, rather than merely formal compliance with durability or repairability requirements. Second, it provides an analytical basis for identifying where regulatory intervention fails to translate into effective market conditions for repair, reuse and value retention during product use, thereby supporting more targeted and evidence-informed policy design.

Keywords: circular economy, consumer protection, right to repair, active use phase, digital product passport.

MOTIVATIONS AND BARRIERS TO RE-USE PRACTICES: A SEGMENTED CONSUMER PERSPECTIVE IN CZECHIA

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Abstract. Transitioning from linear to circular production models requires active consumer engagement, yet the post-purchase phase of re-use remains underexplored. This study identifies the motivations and barriers perceived by consumers regarding the adoption of re-use practices. Data were collected in autumn 2025 through a representative CAWI survey of 750 respondents in Czechia, utilizing quota sampling applied to ensure representativeness with respect to gender, age, and level of education. Responses regarding consumer habits and preferences were measured using a seven-point Likert scale. The data were analysed using descriptive statistics to summarize general tendencies in attitudes and behaviour, and cluster analysis to identify homogeneous groups of consumers based on motivational and barrier-related factors. Specifically, the K-means clustering algorithm was employed to partition the respondents into distinct groups. This non-hierarchical method was selected for its efficiency in handling large datasets and its ability to minimize intra-cluster variance.
Findings reveal a significant attitude-behaviour gap: while respondents express positive attitudes toward repairs and waste prevention, actual engagement remains low. As noted by Bucur (2023) and Lopes et al. (2025), this discrepancy is often driven by low awareness of circular principles. According to the current data, approximately 76% of respondents have never visited a re-use centre and behavioural intentions remain weak, primarily due to low awareness and social norms. While economic benefits and product originality emerge as the strongest motivators that outweigh environmental concerns, persistent doubts regarding hygiene and quality remain major barriers to adoption.
As suggested by Cao et al. (2022), segmenting the market based on consumers' understanding of sustainability is essential for supporting more effective education and targeted communication. Following this approach, our cluster analysis identified four distinct segments: motivated but cautious (6%), price-oriented (31%), sceptics (14%), and realists (49%). The study concludes that fostering a circular economy in households requires more than technical solutions; it necessitates targeted communication strategies, trust-building measures, and increased education to transform positive attitudes into consistent sustainable behaviours.

Keywords: circular economy, sustainable consumer behaviour, re-use, waste prevention, consumer segmentation.

ENHANCING CIRCULAR ECONOMY OUTCOMES THROUGH STRATEGIC COLLABORATION: MANAGEMENT APPROACHES FOR POLICYMAKERS, BUSINESS AND CONSUMERS

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Abstract. This paper examines the transition to a circular eonomy through strategic collaboration among key actors: policymakers, businesses, and consumers. The circular economy is defined as a system that replaces the traditional linear “take-make-dispose” model with practices of reduction, reuse, recycling, and resource regeneration, aiming for sustainable development at micro, meso, and macro levels.

The study provides a comprehensive review of governmental instruments, business activities, and consumer behavior relevant to circular practices. Governments create institutional and regulatory conditions through policies, financial incentives, public procurement, extended producer responsibility schemes, and public–private partnerships, enabling the transformation of business models. Businesses integrate circular principles through circular business model design, knowledge management, industrial symbiosis, and closed-loop supply chains, supported by digital technologies and innovation. Consumers, through conscious consumption, education, and the application of “R” strategies, further reinforce the circular economy.

The aim of this study, based on this theoretical analysis, is to propose a conceptual framework that captures the dynamic interaction among policymakers, businesses, and consumers, illustrating how strategic collaboration can enhance circular outcomes. The framework will emphasize that circular economy performance emerges from interconnected regulatory, organizational, and behavioral mechanisms rather than from isolated interventions. The interaction among these three actors leads to resource optimization, increased reuse, improved value chain management, and the creation of economic and environmental value, highlighting the importance of continuous collaboration and dynamic feedback mechanisms for effective circular economy implementation.

Keywords: circular economy, policymakers, businesses, consumers, circular principles, framework, sustainability.

CIRCULAR FUTURES IN MIGRATION: SUSTAINABLE AND CIRCULAR ECONOMY PRACTICES AMONG MIGRANT ENTREPRENEURS IN TÜRKIYE

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Abstract. This paper presents a descriptive, exploratory analysis of how migrant entrepreneurs in Turkey relate to sustainability and circular economy ideas in their everyday business practices. Rather than testing a specific theoretical model, the study aims to map basic patterns of awareness, interpretations, and self-reported behaviours among a diverse group of migrant-owned small businesses. The research draws on semi-structured interviews with entrepreneurs from different national backgrounds, sectors, and cities. The interview guide covers personal and migration histories, motivations for starting a business, general understandings of sustainable business, and concrete examples of practices such as reuse, repair, waste reduction, and resource efficiency. It also explores perceived obstacles and support mechanisms, including the role of co-ethnic networks and wider local connections. Using a simple qualitative content analysis, the study identifies recurring themes without claiming exhaustive coverage or theoretical saturation. The findings suggest that many participants associate sustainability primarily with economic continuity, business survival, and avoiding waste, while formal environmental terminology is less familiar. Practices that can be considered circular – such as reusing materials, minimizing waste, or extending product lifetimes – often emerge as cost-saving and risk-management strategies rather than as explicit environmental commitments. At the same time, limited access to capital, regulatory uncertainty, and constrained information about support schemes are reported as key barriers to developing these practices further.

Keywords: migrant entrepreneurship, circular economy, sustainability practices, qualitative interviews, Türkiye.