

MANAGEMENT TOOLS FOR IMPLEMENTING 10R INITIATIVES IN COMPANIES

Halyna Mishenina
Klaipeda University
halyna.mishenina@gmail.com

INTRODUCTION

Introduction (Including the problem of the research)

As Lithuania advances its green transition under the EU Green Deal and the Circular Economy Action Plan (CEAP), companies face the practical challenge of operationalising the “10R” circular strategies -Refuse, Rethink, Reduce, Reuse, Repair, Refurbish, Remanufacture, Repurpose, Recycle, Recover - within competitive markets and demanding supply chains. For Lithuania, this implementation task is extremely problematic, as the country's economy is highly linear and dependent on imports. Analysis shows that Lithuania's material footprint is significantly higher than the EU average: 20.1 tonnes of CO2 per capita compared to the EU-27 average. More importantly, Lithuania's industrial economy is only 3.3% cyclical, indicating a huge cyclicity gap of over 96.7%. The political environment increasingly dictates the need to transition to circularity at the design stage (e.g., the Ecodesign Regulation for sustainable products) and standardised reporting (CSRD/ESRS), while national initiatives emphasise industrial symbiosis and material efficiency. However, companies often lack a comprehensive set of management tools that enable them to transform policies and general principles into applicable practices whose results can be evaluated. It is impossible to bridge this huge gap solely through gradual improvements in waste management (low R strategies). This requires significant, fundamental changes driven by decisions taken at a higher level (R0, R1), which will be inextricably linked to effective corporate strategy and strategic choices of management tools. Current research lacks a comprehensive framework that defines, justifies and aligns relevant strategic and operational management tools with 10R initiatives in Lithuania's most material-intensive sectors, while taking into account unique local organisational and cultural barriers. The national goal of achieving full circularity by 2050 requires shifting the discussion from conceptual acceptance to practical action based on tools.

The aim of research Identify and synthesise management tools that will enable Lithuanian companies to systematically implement 10R initiatives and demonstrate their applicability in the value chain of the e industry.

Objectives 1. Explain the 10R concept and its relevance to business management, based on the theoretical basis for circular economy practices in the context of business, management and the broader transition to a circular economy model. 2. Analyse the current state of 10R initiatives in Lithuanian companies, focusing on several company cases. 3. Identify the management tools and methods that Lithuanian companies use (or could use) to implement each of the 10R strategies. 4. Discuss theoretical and practical ideas, determining whether theoretical discussions correspond to practical application in companies. 5. Draw conclusions, highlighting which management approaches work well, where problems exist, and provide suggestions for integrating 10R initiatives into business management in Lithuania.

The methods of the research In our research, we primarily used qualitative research methodology, including a review of literature and policy and industry documents on the circular economy in Lithuania (we analysed documents containing sources and indicators of EU and Lithuanian policy in the field of the circular economy (CEAP 2020, Eurostat circularity indicator, EEA country profile); a synthesis of frameworks was also produced: a comparison of 10R strategies with specific management tools (ISO standards, LCA, eco-design, product data systems, lean manufacturing/TPM, EPR compliance, digital product passports, KPI systems). A multi-purpose analysis of several examples from Lithuania's priority industrial sectors- textiles, furniture and plastics - was also carried out. Companies known for their sustainable or circular practices were selected in each sector. Data was collected from secondary sources (reports, news, press releases). The companies' practices were compared with the 10R model and theoretical concepts (in particular, ReSOLVE). This made it possible to identify the strategies and management tools used.

Theoretical background

The circular economy (CE) promotes the preservation of the maximum value of products, components, and materials for as long as possible, as opposed to the linear "take-make-dispose" model. The 10R concept implements the principles of the circular economy through ten prioritized strategies: refuse, rethink, reduce, reuse, repair, refurbish, rebuild, recycle, and remanufacture (research.vu.nl; whitecardinal.be). These strategies are divided into three groups: 1) more intelligent use and production of products, 2) extending the product life, and 3) recovering value at the end of life (whitecardinal.be).



Figure 1. Key management tools aligned with 10R (Source: compiled and systematised by the author using a graphical AI tool)

Implementing the 10Rs concept requires translating principles into management decisions and tools at the strategic, operational, and analytical levels. At the strategic level, R0 (Refuse) and R1 (Rethink) imply rethinking the business model, including a shift to service models, which is supported by innovation frameworks and transition roadmaps [1]. Researchersemphasize that circular business models require systemic change and multi-stakeholder collaboration [2,3].

- Cooperation tools, including industry clusters and partner platforms, enhance the integration of circular practices into value chains [4].

- Operational tools, especially Lean approaches (5S, Kaizen, Value Stream Mapping, Poka-Yoke), directly support R2 (Reduce) and R3 (Reuse), reducing waste and inefficiencies (ersj.eu; whitecardinal.be). Design for disassembly and modular design enable the implementation of several R-strategies, including repair, refurbishment, and recycling (. Single-piece flow and just-in-time methods reduce excess inventory, enhancing Reduce [5].

- Digital Industry 4.0 technologies - IoT, analytics, and digital twins- support predictive maintenance (R4 Repair) and sharing models (Rethink). These tools also improve material traceability, which is critical for recycling and remanufacturing (papers.ssrn.com). Lithuanian companies are already using digital tools to optimize material flows [6].

- EMAS and ISO 14001 environmental systems enable progress monitoring and goal setting for resource efficiency Life cycle assessment (ISO 14040) helps identify where R-strategies have the greatest impact . New standards, such as ISO 59004, guide organizations in implementing circular economy models .

- Financial tools- cost-benefit analysis, investment appraisal, and sustainability reports - help assess the feasibility of circular projects. International tools, including Circulytics, measure a company's overall level of circularity.

Overall, the literature emphasizes that successful implementation of 10R requires strategic rethinking, operational excellence, and robust measurement systems.

Main findings

Circular economy practices in Lithuania are developing across various sectors, from manufacturing and waste management to tech startups and services. Table 1 provides a comparative overview of individual Lithuanian companies and initiatives, as well as how they implement various 10R strategies using the management tools discussed. The examples provided illustrate the various dimensions of the 10R concept, as well as the supporting tools and practices that enable their implementation. It is worth noting that many companies combine multiple R strategies and often use more than one management approach to achieve their goals.

Table 1. Comparison of 10R initiative implementations in selected Lithuanian companies, highlighting the circular strategies adopted and the management tools or practices used.

Company / Initiative (Sector)	Key 10R Strategies adopted	Management tools and practices enabling 10R implementation
Insectum - Insect Bioconversion Startup (Organic Waste Management)	Recover nutrients/energy by returning food waste to the feed/food chain (via insect larvae); Reduce food waste to landfill	Biotechnological process management (black soldier fly composting); R&D and innovation management to scale waste processing; Compliance with environmental standards (for safe use of insect-derived feed)
Dancer Bus by Vejo Projektai (Transportation Manufacturing)	Rethink the business model (lightweight e-bus designed for sustainability); Recycle materials in production (composite panels include recycled PET); Reduce energy use (lighter bus = lower consumption)	Eco- design of product (lightweight, modular bus design for easy maintenance); Collaboration with research institutions for material innovation; Lean manufacturing in production to eliminate waste; ISO 9001/14001 certified processes ensuring quality and environmental management
JSC Ekobazė (Waste Management & Recycling)	Recycle end-of-life products (e.g. tire recycling into rubber granules); Recover materials and secondary raw inputs from waste; Reuse where possible (facilitating reuse of collected items)	ISO 14001 Environmental Management System guiding waste treatment operations; Investment in modern recycling technologies; Lean logistics for efficient collection and processing; Health & safety management to handle waste properly (ISO 45001)
Plasta AB (Plastic Recycling and Manufacturing)	Recycle (converts post-consumer plastic waste into new products like garbage bags); Reduce use of virgin plastics by substituting recycled material; Refuse single-use plastics by providing recycled alternatives	Certified for EU plastic recycling standards (e.g. EuCertPlast); ISO 14001 EMS to continually improve resource efficiency; Lean production techniques to maximize yield from recycled feedstock; Product innovation focusing on recycled content and design for recyclability
Repowered Lab (RepiLab) (Electronics Refurbishment)	Refurbish/Remanufacture used electronics (restore smartphones and devices for resale); Reuse components (harvested from old devices); Reduce e-waste generation by extending product life	Quality management and testing protocols (to ensure refurbished devices meet standards); Lean service process (streamlined repair workflow, 5S in repair labs); Training and certification of technicians (to safely handle and replace components); Consumer education to promote acceptance of refurbished products (shifting behavior toward reuse)
Zero Waste Retail Initiative (e.g. Zerowasteshops.lt platform)	Refuse and Reduce single-use packaging (promotes selling products without disposable plastics); Reuse containers (encourages customers to use refillable containers)	Digital platform and network management connecting consumers with zero-waste shops; Awareness campaigns (as a soft management tool influencing consumer behavior);Collaboration among small businesses to standardize refill systems; (Lean principles in inventory to reduce overstock and waste in shops)

Compiled by the author. Sources: Company data and descriptions from industry platforms and reports [2, 6-8] Additional information compiled from European circular economy case studies and company communications. (All examples reflect initiatives active in Lithuania as of 2024 - 2025).

MAIN RESULTS AND CONCLUSIONS

The results show that: 1) despite the ambitious and large-scale nature of the 10R concept, Lithuanian companies are achieving tangible, albeit uneven, success in implementing these principles in practice. The key and obvious result is that no single tool is sufficient on its own. Successful implementation of CE initiatives is achieved through a comprehensive approach combining strategic, operational and collaborative mechanisms: 2) Alignment of economic incentives and CE goals is crucial. Companies are most likely to adopt 10R practices when these practices also reduce costs or increase competitiveness. Management tools that emphasise this win-win effect are easy to implement and can be used to integrate circular economy principles; 3) external factors (policy and market) act as a catalyst and guide circular actions, effectively acting as external 'management tools'. EU directives, as well as national targets and customer requirements, set the direction, while individual companies create the practical basis and experience. Lithuanian companies that have been successful (e.g., those reviewed in our case studies) have often done so by anticipating or responding to these factors proactively rather than reactively.

From a theoretical perspective, our research emphasised that the 10R framework is a useful guide for evaluating companies' initiatives and that Lithuanian companies cover the entire spectrum to varying degrees. We found specific examples of each R category being addressed: reducing resource use in production, reuse through service models, recycling through technical innovation, etc. However, the balance is somewhat skewed, with recycling still being the dominant paradigm. In our view, this means that there is untapped potential in strategies such as rejection, rethinking, and fully embracing product life extension. Management therefore needs to broaden its focus from end-of-life solutions to include upstream innovation. Tools such as eco-design, circular product development processes, and research into new business models (e.g., leasing, sharing platforms) should be more actively implemented. Further research will follow precisely along this vector.

References

- European Commission. (n.d.). Circular economy strategy. Retrieved January 2025 from https://environment.ec.europa.eu/strategy/circular-economy_en
- Eurostat. (n.d.). Statistics explained. Retrieved January 2025 from <https://ec.europa.eu/eurostat/statistics-explained/index.php?oldid=655955>
- Kaunas University of Technology. (n.d.). Research portal. Retrieved January 2025 from <https://en.ktu.edu>
- European Circular Economy Stakeholder Platform. (n.d.). Circular economy resources. Retrieved January 2025 from <http://circulareconomy.europa.eu>
- Economic and Social Research Journal (ERSJ). (n.d.). Retrieved January 2025 from <http://ersj.eu>
- Ministry of the Economy and Innovation of the Republic of Lithuania. (n.d.). Retrieved January 2025 from <http://eimin.lrv.lt>
- Ensun. (n.d.). Circular economy in Lithuania: Key takeaways. Retrieved January 2025 from <https://ensun.io/search/circular-economy/lithuania#:~:text=Key%20takeaway>
- European Environment Agency. (2024). Lithuania 2024: Circular economy country profile [PDF]. Retrieved January 2025 from https://www.eea.europa.eu/_lithuania_2024-ce-country-profile_final.pdf/@/download/file#:~:text=A%20startup%20company%20was%20established