MATERIAL CYCLES and WASTE MANAGEMENT RESEARCH

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Abstracts

【Special Issues: Reuse and Sharing toward the Circular Economy】

1. Prospects for Reuse: Moving toward a Circular Economy

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Abstract

Along with the growing international movement toward a circular economy, reuse initiatives are gradually gaining momentum in Japan. Since reuse is considered to be a higher priority than recycling in the waste management hierarchy, this article describes the types of reuse, measures to promote reuse, and the relationship between reuse and environmental load, based on recent activities.

Keywords: sound material-cycle society, circular economy, 3Rs, sharing, environmental load

2. Sharing, Reuse, and the Circular Economy

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Abstract

This paper provides an overview of the concept and social significance of the sharing economy while examining its relationship with the circular economy. It highlights how advances in digital technology have expanded peer-to-peer transactions, contributing to resource efficiency and reduced environmental impact through the utilization of idle assets and skills. The domestic sharing economy market size is projected to reach approximately 3 trillion yen by fiscal year 2024. Environmental benefits, such as CO_2 reduction and waste suppression, have also been reported, drawing attention to its potential contribution to realizing a circular society. Against this backdrop, the paper presents the institutional context, with specific case studies and a discussion of the challenges to widespread adoption and the multifaceted role which the sharing economy can play in a circular society.

Keywords: sharing economy, resource circulation

3. Reuse and the Law: Focusing on Correlations with Reuse Businesses

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Abstract

The Basic Act on the Circular Economy defines useful waste materials as “circular resources” and the direct use of circular resources as products, among other things, as “reuse.” The reuse market reached approximately 3.5 trillion yen in 2024. This expansion underscores its importance, not only in environmental law but also in commercial transactions and consumer protection. Within environmental regulation, the central issue is whether items qualify as “waste” under the *Waste Management and Public Cleansing Act*. Other statutes, such as the *Act on Promotion of Resource Efficiency* and the *Home Appliance Recycling Act*, also touch on reuse but impose compliance costs and risks of improper handling. The criteria for determining whether an item constitutes “waste” have recently become more objective; Non-environmental laws include the *Secondhand Goods Business Act* and the *Act on Prevention of Transfer of Criminal Proceeds*, which address stolen goods and money laundering. Consumer-related laws, such as the *Specified Commercial Transactions Act* and the *Consumer Contract Act*, further ensure fairness. Additionally, the *Personal Information Protection Act* and certain product safety rules apply. While reuse reduces environmental burden and stimulates economic activity, there is scope for a comprehensive “Reuse Promotion Act” in order to provide a more fully coherent framework.

Keywords: reuse, waste, Basic Act on Establishing a Sound Material-Cycle Society,
Secondhand Goods Business Act

4. Consumer Reuse Choices in Japan and Policy Targets in European Countries

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Abstract

In the transition toward a circular economy, the promotion of reuse has become a major challenge, yet its actual status remains insufficiently understood. This study collected and reviewed information on consumer reuse choices in Japan. On the household inflow side, reuse rates for passenger cars and housing are approximately 40-50%, while reuse rates for most other products are about 10%. On the household outflow side, reuse rates for passenger cars are about 80%, whereas furniture (tables and desks), mobile phones, and sake bottles are around 20%, with clothing, household appliances, and beer bottles logging in at about 10%. Although further promotion of reuse is required, Japan has set very few explicit reuse targets. In contrast, several European countries have recently introduced reuse targets. This paper reports on the comprehensive targets in Flanders, Belgium; product-specific policy targets for textiles, linens, shoes, furniture, and packaging in France; textile targets in the Netherlands; and household appliance targets in Spain. The target values, indicators, and data sources are outlined for each case.

Keywords: reuse rates, waste prevention, Extended Producer Responsibility (EPR), policies to promote reuse

5. Business Models and Strategic Entry into the Reuse Market by Manufacturers, Retailers, and Waste-related Industries

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Abstract

This paper examines the growing reuse market in Japan and explores how manufacturers, retailers, and waste-related industries are entering the sector and constructing business models. Using examples from the book, *Textbook of Reuse Business*, this study classifies the types of reuse introduction and key implementation considerations. The paper also highlights notable case studies, the impact of ICT and AI (including automated appraisal systems) and the potential for cross-sector collaboration with local governments. Reuse is positioned not only as a business opportunity but also as an essential driver for a circular economy.

Keywords: reuse, circular economy, AI appraisal, local government, reverse distribution

6. Overseas Reuse Promotion Policies and Reuse Businesses

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Abstract

This report provides an overview of policies promoting reuse and the current state of reuse businesses overseas, with a focus on Europe. In the EU, reuse is positioned as a core measure of the circular economy and is ranked above recycling in the waste management hierarchy. Various promotion measures are being implemented in each country, such as setting legal targets, establishing reuse shops and centers, offering tax incentives, and prioritizing reuse in public procurement. To build consumer trust, efforts are being made to enhance quality assurance, information provision, and certification systems. In the field of food containers, reuse services utilizing digital management and deposit systems are expanding. In the future, the introduction of digital product passports is expected to further visualize product histories and improve reliability. Despite all the positives, challenges do remain, such as ensuring consumer protection and legal guarantees in online transactions. Reuse will become increasingly important from the perspectives of resource circulation, environmental impact reduction, and job creation.

Keywords: circular economy, reuse, deposit, packaging, digital product passport

7. Local Government Initiatives toward Reuse: Case Study on Zama City

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Abstract

Since Zama City does not have a waste incineration facility within its jurisdiction, it processes combustible waste, as well as part of the non-combustible and bulky waste, at the Kouza Clean Center. This center is operated by the Kouza Sanitation Facility Association jointly established by the three neighboring cities of Ebina, Ayase, and Zama. Due to the relatively limited processing capacity of the incinerator at this center, which was renewed in 2019 (Reiwa 1), the three cities have been promoting reuse and recycling initiatives in order to reduce the volume of waste being incinerated. As of 2025 (Reiwa 7), while the amount of combustible waste continues to decline, the incineration facility remains under pressure. The situation underscores the need to further advance current efforts and implement new measures. It is our hope that the various initiatives being undertaken by Zama City will serve as a model and contribute to the promotion of reuse efforts in other municipalities.

Keywords: reuse, Zama City, reduction of incineration volume, circular economy, resources

8. Reuse of Lithium-ion Batteries from Electric Vehicles: Current Status and Future Prospects

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Abstract

The rapid growth in adoption of electric vehicles (EV) has resulted in a significant increase in end-of-life lithium-ion batteries (LiBs) being generated worldwide. Reusing these batteries —rather than disposing or recycling them immediately— has attracted attention as a means of maximizing resource utilization and reducing environmental impact. When the State of Health (SOH) of an EV LiB falls to about 70-80%, the battery is often removed from the vehicle but can still be repurposed for stationary energy storage and other secondary applications. A sufficient supply of used batteries, appropriate diagnostic and grading technologies, and cost reductions are critical for safe and effective reuse. This paper outlines the reuse process for EV LiBs, the distribution and flow of used batteries, and demos of real-world cases. Challenges such as regulatory frameworks, safety certification, and market development are also discussed. Promoting reuse not only enhances resource circulation and reduces waste but also ultimately supports the realization of a sustainable society.

Keywords: Electric Vehicles (EV), Lithium-ion Battery (LiB), reuse, State of Health (SOH)