MATERIAL CYCLES and WASTE MANAGEMENT RESEARCH

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Abstracts

【Special Issues: Societal Implementation of Circular Economy in Japan】

1. Japan’s Uniquely Nuanced Circular Economy Development Strategy

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Abstract

Construction of circular economies is accelerating in quite a few countries, particularly in EU member countries, among others. The ultimate image of a circular economy is, however, not unique and will most likely take various forms as it comes into being. The development of any circular economy will be subject to factors such as socio-economic structures, lifestyles, cultural traditions, history, etc. depending on each country or region. In other words, how a circular economy is realized will vary from country to country and region to region; it will be path-dependent. Japan, which gives more weight to human relationships over personal independence, is trying its own unique path toward a circular economy based upon co-creative relationships among businesses which share both likenesses and differences on the one hand, and upon competitive relationships on the other. The Japanese style of a circular economy seeks to realize well-balanced private and public interests, achieved by a system that pursues product-chain control on the basis of the institutional infrastructure which consists of both hard and soft laws.

Keywords: circular economy, principle of co-creation, product chain control, institutional infrastructure, path-dependence

2. Overview of Japanese Policy for the Transition to a Circular Economy

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Abstract

The transition to a circular economy in Japan will lead to new growth by reducing resource inputs and consumption; promoting long-term use of products through reuse, repair, and recycling; and utilizing waste as a resource to create added value. It is also a measure that will contribute to mitigating climate change; address biodiversity loss; enhance industrial competitiveness; and ensure economic security. In Japan, the government policy, *The 5th Fundamental Plan for Establishing a Sound Material-Cycle Society adopted in 2024*, calls for Japan's transition to a circular economy to be deemed a national strategy. As specific measures, the government is working to promote regional resource recycling, including the Forum of Local Authorities for Resource Recycling, in order to create a market for recycled materials by strengthening cooperation between recyclers and manufacturing industries. This will include the establishment of resource recycling networks and hubs so that it will be able to contribute to the formation of international rules for the field of resource recycling.

Keywords: circular economy, resource circulation, cooperation between recycling manufacturing industries

3. Initiatives toward Realization of a Circular Economy by the Panasonic Group

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Abstract

Currently, the overflow of material products in society is causing a variety of problems, especially in developed countries. Along with the effects of global warming, the issue of resource depletion is becoming increasingly more critical. In order to reduce consumption of limited natural resources, the Panasonic Group is promoting horizontal recycling of metals and plastics from collected waste home appliances. In particular, we introduce how gold, silver, and copper can undergo recovery and circulation from waste printed circuit boards found in urban mines (PMP loop). We also present an autonomous home appliance disassembly system that is predicted to be an essential part of the future circular economy field due to a declining domestic labor force and on-site workload. In addition, as an example of a circular economy business for home appliances, we introduce a manufacturer-certified refurbishment business that returns defective products that were previously discarded to the same performance and safety level as new products. There is also a business model that uses cloud information from IoT home appliances to notify users of maintenance and other matters and connect to maintenance services to allow that users can use products for a long time.

Keywords: circular economy, horizontal recycling, autonomous disassembly system, refurbishment, IoT home appliances

4. Efforts toward a Circular Economy by JX Advanced Metals

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Abstract

An increase in the demand for non-ferrous metals, such as copper, is expected as a result of various developments within our data society and the spread of renewable energy and electric vehicles. As the supply of natural resources is limited and concern for the future stability of supply chains greatens, however, the recycling of metals from used products becomes ever more crucial in order to meet the increasing demands of combining both recycling and natural resource supply.

JX Advanced Metals promotes efforts to create added value by balancing resource circulation and decarbonization as a way of realizing a circular economy within the non-ferrous metals industry. In the copper business, for example, JX has formulated what is called the Sustainable Copper Vision, which indicates measures aimed at the sustainable supply and development of copper. It also promotes “green hybrid smelting” with the goal of increasing the ratio of recycled materials to 50% by the year 2040, while also co-creating resource circulation models with stakeholders through the introduction of a new supply scheme for 100% recycled electrolytic copper.

Furthermore, JX will contribute to building a sustainable society through the development of advanced materials with durability and high functionality, technological innovation through collaboration with universities and companies, and the development and commercialization of closed-loop recycling technology for used lithium-ion batteries.

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Keywords: non-ferrous metals, circular economy, recycling, resource circulation, closed-loop recycling

5. Efforts and Challenges by CLAS for Social Implementation of the PaaS (Product as a Service) Business Concept

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Abstract

This paper discusses the various challenges surrounding social implementation of a circular economy (CE), especially as they relate to the efforts of CLAS. Social implementation of CE is defined by five factors: Widespread adoption; Realization of social benefits; Economic independence; Integration into social systems; and Development of related systems. The concept of PaaS for durable consumer goods is still yet not well known, nor has it been widely adopted. Achieving economic independence requires substantial investment and time, though investment and financing tends to be cautious due to concerns about market size. Furthermore, the absence of infrastructure for procuring, delivering, and collecting circular products poses an additional barrier to entry when integrating into social systems. CLAS provides expensive consumer durables on a monthly basis while also facilitating returns, purchases and assetization. There are also discounts offered for long-term use. This is all to ensure economic efficiency through its systems and operational infrastructure. The company aims to improve inventory utilization rates and reduce sales/administrative expenses. CLAS also promotes the development of its own circular products, contributing to decarbonisation, and waste/resource reduction.

While the development of CE is important, market awareness is ambiguous, and will therefore require collaboration between the public, private, and academic sectors.

Keywords: circular economy, social implementation, consumer durables PaaS (Product as a Service), CLAS, business issues

6. Circular Economy Practices in the Construction Industry

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Abstract

The construction industry accounts for more than half of Japan's total material input and more than 10% of its total waste volume. Therefore, it is urgent to transition to a circular economy through the resource circulation of construction materials. This paper introduces the current state of material flows and resource recycling in the construction industry. Through the examples of resource recycling initiatives conducted by our company, including concrete, aluminum panels, glass plates, and plastics, this paper organizes the future challenges and prospects for resource circulation in the construction industry.

Keywords: construction industry, separation and deconstruction, materials circulation, resource recovery, supply chain

7. Trends and Prospects for Circular Economy-related Disclosures

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Abstract

In light of the overall progression of sustainability-related information disclosure, the development of circular economy-related-disclosure schemes/indicators is also advancing. Regarding disclosure schemes, WBCSD is developing the Global Circularity Protocol, with version 1.0 scheduled to be released at COP30 in November 2025. Furthermore, regulations and guidelines on the disclosure have already been established in the EU, China, and Japan. Alongside this development, companies are also exploring circular economy-related disclosure and corporate value assessments, with some nascent examples. The objectives of pursuing a circular economy are considered to be more diverse than climate change or decarbonization, etc., making it important to clarify the objectives in information disclosure and corporate valuation. As such, future scheme development should ensure flexibility to accommodate this diversity.

Keywords: circular economy, disclosure, circularity metrics, Global Circularity Protocol for Business, fund

8. Japan’s Unique Circular Economy

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Abstract

In this article, as a summary of this special issue, Japan’s unique situation regarding its transition to a Circular Economy is discussed. The legislative systems that have been implemented are reviewed, along with background issues such as the industrial structure and the possible unique characteristics of citizens as users. The paper then discusses the specific difficulties of a Circular Economy in regard to non-financial information disclosure, which has recently been the subject of deep discussion. The paper also touches upon traceability systems that are the infrastructure for such disclosure.

The author tries to sort out various issues in this context: One important point, as discussed at the beginning of the article, is that Japan has yet to reach a consensus on the definition of Circular Economy. This is only seen as an opportunity for Japan to take initiatives in the transition of global economy towards Circular Economy.

Keywords: circular economy, circularity, non-financial information disclosure, traceability system