

# Toward the sustainable management and efficient use of natural resources

— Challenges of Japanese Law <sup>1)</sup>

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## 1. Introduction

The Japanese ‘modern’ waste management law was implemented with the Public Cleansing Act in 1970. Thus, the Act has a 47-year history. It has extensively contributed to the improvement of public hygiene in the present times, and its waste management system has already become a ‘tradition’ in Japanese society. In keeping with this ‘tradition’, Japanese waste management laws need to be revised with respect to sustainable management and efficient use of natural resources.

In Japan, it has been stressed repeatedly that to realise a sustainable society, a sound material-cycle, low-carbon, and symbiotic society must also be established at the same time. Of these, efforts toward the realisation of a sound material-cycle society are considered to have made significant progress since the Basic Act on Establishing a Sound Material-Cycle Society (‘the SMCS Act’: Act No. 110 of 2000) was enacted 17 years ago.

In Japan, however, the legal system for waste treatment established in the Meiji era (1968-1912) based mainly on the enforcement of strict regulations

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1) This article is based on a presentation to the International Conference: Application of iron/ steel slag in construction industry for sustainable development, Ministry of Construction, Vietnam Institute for Building Materials (VIBM), 6 December 2016 in Hanoi/Vietnam, titled: ‘Toward the sustainable management and efficient use of natural resources— Challenges of Japanese Law’. This work was supported by JSPS Grant Number JP26380055 and JP16H03544.

for maintaining public hygiene still remains as an overarching framework. It is questionable whether this framework is capable of addressing demands that are driving many of the policy goals sought today, such as the need to secure resources.

This article examines this issue with reference to notable movements in Europe in recent years to help ensure that the Japanese system should be reformed to meet international standards<sup>2)</sup>.

## 2. Why ‘cyclical use of resources’?

### 2.1 Sustainable development and the problem of resources

‘Sustainable development’ is a concept developed to combat problems resulting from the rapid expansion of human activities and population increase. Such problems include accelerating environmental destruction and concerns for the depletion of natural resources, the North-South divide, and the clash between environmental conservation and economic growth.

The concept of ‘Sustainable development’ originated from the Report of the World Commission on Environment and Development (WCED), also known as the Brundtland Commission;

‘Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs’<sup>3)</sup>.

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- 2) The Study Group for legal system of circulative resources, Turning ‘Waste’ into ‘Resource’—Toward the sustainable management and efficient use of natural resources, 2015 (in Japanese). This article is based on a Research by the Study Group for legal system of circulative resources/ Professor Emeritus Naohito ASANO (Fukuoka University), Professor Kenichiro YANAGI (Meiji University), Professor Akira FUKUSHI (Hokkai-Gakuen University), Professor Akemi ORI (Sophia University) and Professor Tomoko SEIICHI (Seinan Gakuin University), and Dr Midori MIZUKAMI and Dr Sigesada TAKAGI (Mizuho Information & Research Institute, Inc.).
  - 3) The World Commission on Environment and Development, Our Common Future, 20 March 1987.

In the background to this concept, the industrially advanced countries developed a lifestyle characterised by mass production, mass consumption, and mass waste generation. Although some improvements are underway today, the countries failed to reflect on the finite availability of resources and the destructive impacts on the environment imposed by the extraction and use of resources.

Changes must be made to the current approach to resource use in order to achieve sustainable development. Resources are finite, and environmental destruction and pollution occur as a result of resource extraction and use. At the same time, indirect environmental impacts from resource use also continue to rise.

‘Sustainable development’ has been extended by the UN:

- 1992 The UN Conference on Environment and Development in Rio,
- 2002 The World Summit on Sustainable Development:  
Rio+10 in Johannesburg,
- 2012 The UN Conference on Sustainable Development: Rio+20 in Rio.

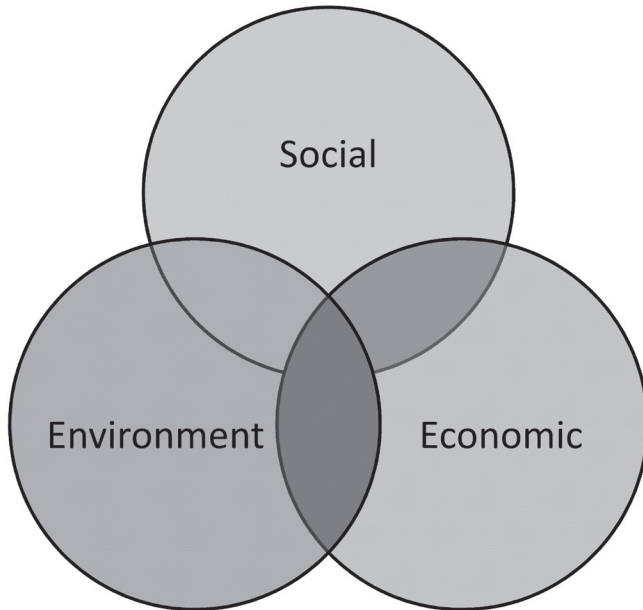
Lately, in September 2015 the 2030 Agenda for Sustainable Development Goals was adopted by the United Nations General Assembly<sup>4)</sup>. Of these, Goal 12 is to ‘ensure sustainable consumption and production patterns’. Specific targets set for it include ‘achieving the sustainable management and efficient use of natural resources’ (12.2) and ‘substantially reducing waste generation through prevention, reduction, recycling, and reuse’ by 2030 (12.5).

In this manner ‘Sustainable development’ is a common philosophy for social development (Figure 1: Sustainable Society).

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4) The United Nations, Transforming our world: the 2030 Agenda for Sustainable Development, 18 September 2015 (A/70/L. 1).

[Figure 1] Sustainable Society



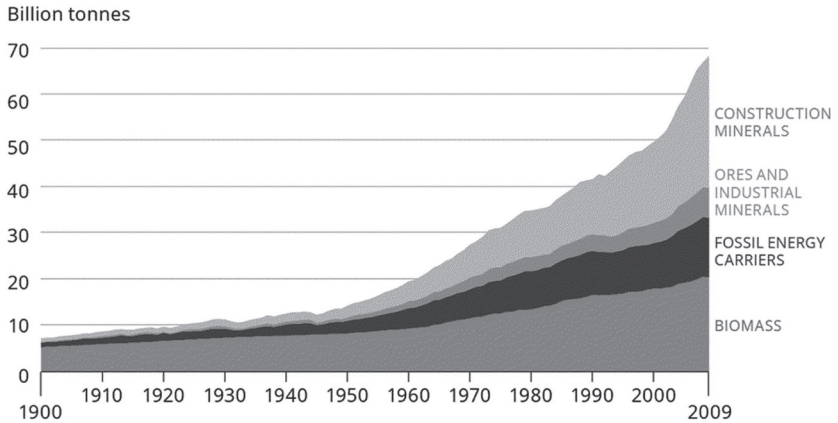
On the other hand, as the global population rises and newly emerging countries achieve remarkable economic growth, the volume of resource use has increased worldwide.

According to a study by the United Nations (Environmental Programme), total material extraction has increased by about eight times in the 20th century, indicating that many resources are reaching their yield limits (Figure 2: Global material use by resource type)<sup>5)</sup>.

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5) UNEP, Decoupling natural resource use and environmental impacts from economic growth: A Report of the Working Group on Decoupling to the International Resource Panel, 2011.

[Figure 2] Global material use by resource type



<Source: European Environment Agency (EEA)>

In light of the current state, how can we use resources to ensure sustainable development?

We can, for example, reduce the use of natural resources by putting resources into cyclical use, maximise service generation with minimal resources through technological innovation, and shift to resources that have minimal environmental impacts.

In Japan, a society has tried to realise through such efforts—a society in which ‘environmental impact is minimised by controlling the consumption of resources through the efficient use of materials and the implementation of recycling from production and distribution to consumption and disposal’—is called a ‘sound material-cycle society’ (‘SMC society’). The establishment of a SMC society is considered one of the most important components of sustainable development.

## 2.2 Not ‘waste’ but rather ‘resource’

There are many approaches to establish a SMC society. We can examine an

approach in which items are used without being wasted based on the idea of ‘mottainai’—a feeling of regret at unnecessary waste because that waste represents a lack of recognition or understanding of the intrinsic value of a resource—an expression originating in Japan that has now become an international concept <sup>6)</sup>.

The ‘mottainai’ also means not ‘waste’ but rather ‘resource’. For example, after plastic bottles are used as materials for a variety of products including clothing fabrics and ball-point pens. Such useful waste, used products, and by-products are called ‘circulative resources’.

Reduction in resource use, including improvements in resource efficiency, with the goal of realising sustainable development is an urgent and pivotal issue even today.

### 3. Trends in the EU

#### 3.1 The transition to a new society envisioned in a growth strategy

Europe 2020 Strategy<sup>7)</sup>, the EU’s mid-term growth strategy adopted in 2010, proposes the following three key types of growth:

- (1) smart growth;
- (2) inclusive growth; and
- (3) sustainable growth.

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6) International interest in ‘mottainai’ was sparked by a visit to Japan in 2005 by Dr Wangari Maathai, a Kenyan environmental activist who was the first person to receive the Nobel Peace Prize for achievement in this field. Dr Maathai was deeply impressed when she heard about ‘mottainai’ and decided to spread the word to the rest of the world. She felt that this single word neatly expressed the basic concept of the environmental conservation movement: ‘reduce, reuse, recycle’. She also thought that it encompassed a fourth important element: ‘respect’ for the earth’s limited resources.

7) Communication from the Commission, EUROPE 2020: A Strategy for Smart, Sustainable and Inclusive Growth, COM(2010) 2020.

Of these, the sustainable growth proposes to decouple economic growth from resource and energy use through efficient use of resources and the adoption of renewable energy ‘for a resource-efficient, greener and more competitive economy’.

In addition, ‘resource-efficient Europe’, one of the EU’s flagship initiatives for sustainable growth, is aimed at supporting the shift toward a resource-efficient and low-carbon economy. In the roadmap for this transition, ‘turning waste into a resource’ is listed as one of the goals<sup>8)</sup>. There is a clear transition in the EU toward making use of waste as a resource—as part of its efforts to use resources instead of wasting them.

### **3.2 A movement to promote the cyclical use of resources**

The move toward turning waste into a resource in the EU demonstrates the importance of promoting the cyclical use of resources.

The question is: how are circulative resources treated in the EU?

Like Japan, the EU established a law called the Waste Framework Directive in 1975 (75/439/EEC) that addressed traditional waste problems such as overcapacity at landfill sites and illegal dumping. However, as the focus shifted to the efficient use of resources, a law with a conventional approach to waste management was not compatible with the goal of enabling effective use of resources. For this reason, the law underwent a drastic overhaul in 2008 (WFD: 2008/98/EC).

The revisions covered a wide variety of areas. One of the key points from the standpoint of resource use is that the revisions clarified the principles for waste management and introduced the concepts of ‘by-product’ and ‘end-of-waste’. They are new categories of recyclable resources.

According to WFD Waste legislation and EU policy the following waste

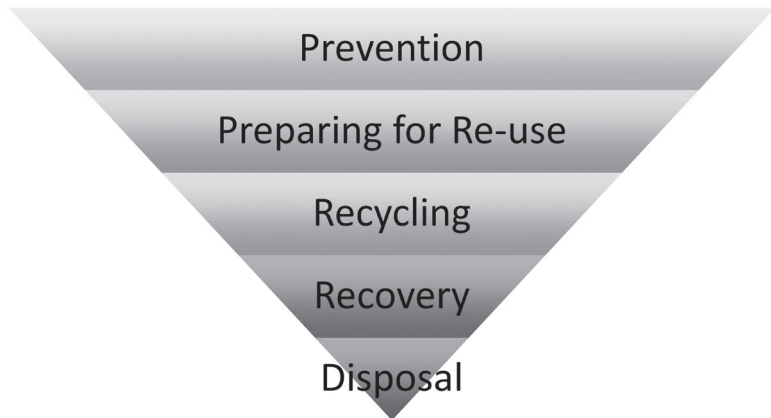
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8) Communication from the Commission, Roadmap to a Resource Efficient Europe, COM (2011) 571 final.

management hierarchy shall apply in order of priority (Article 4 WFD, Figure 3: Waste management hierarchy):

- (a) prevention;
- (b) preparing for re-use;
- (c) recycling;
- (d) other recovery, e.g. energy recovery; and
- (e) disposal.

**[Figure 3] Waste management hierarchy (Article 4 WFD)**



By-product is a substance or object, resulting from a production process, the primary aim of which is not the production of that item. By-products can come from a wide range of business sectors, and can have different environmental impacts. A by-product is defined as non-waste in WFD provided that the substance or object meets all of the following criteria (Article 5 WFD):

- a) further use is certain;
- b) it can be used directly without any further processing;



- c) it is produced as an integral part of a production process; and
- d) further use is lawful that is, it complies with all existing and relevant product, environmental and health-protection requirements and standards and will not lead to overall adverse environmental or human-health impacts.

#### Article 5 WFD By-products

1. A substance or object, resulting from a production process, the primary aim of which is not the production of that item, may be regarded as not being waste referred to in point (1) of Article 3 but as being a by-product only if the following conditions are met:

- (a) further use of the substance or object is certain;
- (b) the substance or object can be used directly without any further processing other than normal industrial practice;
- (c) the substance or object is produced as an integral part of a production process; and
- (d) further use is lawful, i.e. the substance or object fulfils all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts.

The concept of end-of-waste (EoW) sets out conditions under which a substance or object, defined as waste, can be re-defined as non-waste after undergoing a recovery operation. The substance or object must meet the following criteria (Article 6 WFD)<sup>9)</sup>:

- a) it is commonly used for specific purposes;
- b) a market or demand exists for it;
- c) the use is lawful, it meets the technical requirements for the specific

- purpose and complies with all existing legislation and applicable standards;  
and  
d) its use will not lead to overall adverse environmental or human-health impacts.

Article 6 WFD End-of-waste

1. Certain specified waste shall cease to be waste within the meaning of point (1) of Article 3 when it has undergone a recovery, including recycling, operation and complies with specific criteria to be developed in accordance with the following conditions:
  - (a) the substance or object is commonly used for specific purposes;
  - (b) a market or demand exists for such a substance or object;
  - (c) the substance or object fulfils the technical requirements for the specific purposes and meets the existing legislation and standards applicable to products; and
  - (d) the use of the substance or object will not lead to overall adverse environmental or human health impacts.

The EU promotes zero-waste resource use by clarifying the differences between waste and non-waste. At the same time, the EU also promotes the conversion of waste into high-quality renewable resources by turning waste into resources only when the waste meets certain standards<sup>10</sup>.

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- 9) A methodology to develop the criteria has been elaborated by the Joint Research Centre. After having agreed this methodology with the EU member states, the Commission is preparing a set of end-of-waste criteria for priority waste streams. The criteria have been laid down for iron, steel and aluminium scrap (Council Regulation (EU) No 333/2011 of 31 March 2011 establishing criteria determining when certain types of scrap metal cease to be waste under Directive 2008/98/EC); glass cullet (Commission Regulation (EU) No 1179/2012 of 10 December 2012 establishing criteria determining when glass cullet ceases to be waste under Directive 2008/98/EC); and copper scrap (Commission Regulation (EU) No 715/2013 of 25 July 2013 establishing criteria determining when copper scrap ceases to be waste under Directive 2008/98/EC).
  - 10) Communication from the Commission, Towards a Circular Economy: A Zero Waste Programme for Europe, 2014/9/25, COM (2014) 0398 final/2; Closing the Loop - An EU Action Plan for the Circular Economy, 2015/2, COM (2015) 614/2.

### 3.3 Toward a sustainable society

The trends in the EU toward zero-waste resources can be summarised into three points.

- (1) In the EU, ‘the impact on the environment and human health’ is considered an absolute principle that must be followed when deciding whether a resource can be used.
- (2) The system is designed in such a way that materials that are not hazardous and may or may not be waste, are used instead of being wasted while hazardous materials are managed properly.
- (3) By focusing on whether a material is hazardous to human health and the environment and categorising ways in which materials are used or managed, the new system contributes to the unified enhancement of environmental conservation and economic growth, and the establishment of a sustainable society.

## 4. The Japanese legal system and its challenges

### 4.1 Toward the establishment of a sound material-cycle society

As already mentioned, the SMCS Act, the basic framework for transforming a mass production, mass consumption, and mass waste-producing society—all of which involve the use of a massive amount of resources—into a SMC society was enacted in 2000 (Figure 4: Toward the establishment of a sound material-cycle society). The year 2000 was celebrated as the birth year of the SMC society<sup>11)</sup>. In addition, five related individual acts were also established at the same time (Figure 5: Regulations in accordance with the properties of individual products).

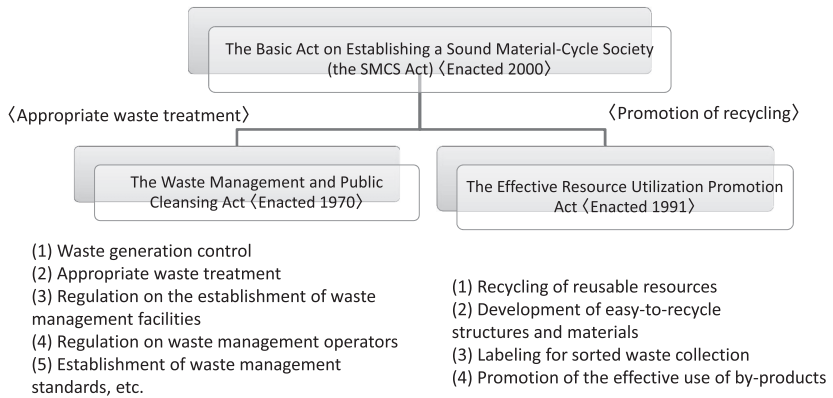
Among other achievements, the SMCS Act

- (1) clarified the description of the SMC society to be established;  
‘Sound Material-Cycle Society’ is defined as ‘a society in which the

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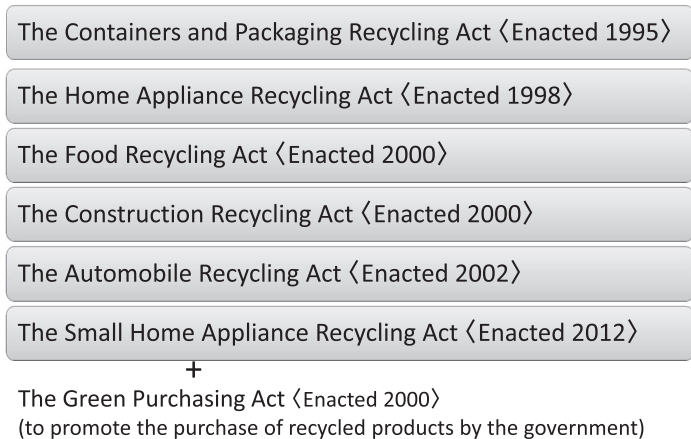
11) Ministry of the Environment Japan, A Sound Material-Cycle Society through the Eyes of Hokusai, 7 July 2008.

[Figure 4] Toward the establishment of a sound material-cycle society



<Source: Ministry of the Environment Japan>

[Figure 5] Regulations in accordance with the properties of individual products



<Source: Ministry of the Environment Japan>

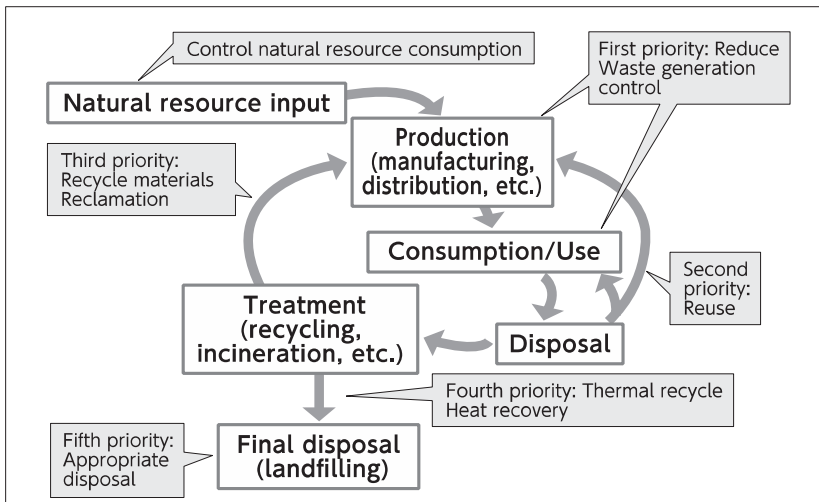
consumption of natural resources will be conserved and the environmental load will be reduced to the greatest extent possible, by preventing or reducing the generation of waste and others from products, etc., by promoting proper cyclical use of products, etc. when these products, etc. have become circulative resources, and by ensuring proper disposal of circulative resources not put into cyclical use' (Article 2 (1) SMCS Act).

(2) defined items subject to the Act as 'waste and others' irrespective of whether they are valuables or non-valuables, and defined useful waste and others as 'circulative resources' to promote the cyclical use of such resources;

Basic principles of the cyclical use and disposal of circulative resources:

- (i) circulative resources, that what can be reused must be reused.
- (ii) circulative resources, that what are not reused under the preceding item (i) and can be recycled must be recycled.
- (iii) circulative resources, that what is not reused under the above item (i) nor recycled under the preceding item (ii), and from which

[Figure 6] Vision of a SMCS



<Source: Ministry of the Environment Japan>

heat recovery is possible, heat recovery must be undertaken.

- (iv) circulative resources, that what does not undergo cyclical use under the foregoing three items must be disposed of (Article 7 SMCS Act).
- (3) legislated the hierarchy of waste management (Figure 6: Vision of a SMCS);
- (4) developed a more comprehensive and systematic framework through the formulation of the Fundamental Plan for Establishing a SMC Society; and
- (5) clarified the responsibilities of a waste generator and an extended producer.

#### **4.2 The unchanging concept of waste and the introduction of the concept of 'circulative resources'**

The SMCS Act was enacted with the aim of establishing a foundation for promoting measures related to waste and recycling in a comprehensive system, while promoting effective initiatives toward the establishment of a SMC society in coordination with individual acts related to waste and recycling.

In light of the background to the enactment of this Act, it can be said that one of the most important goals of the Act was to take a unified approach to 'proper treatment of waste' and the 'promotion of effective use of resources'<sup>12)</sup>.

In the first place, waste management policies in Japan began with the goal of improving public hygiene. The target of the Waste Disposal Act (Act No. 31 of 1900, repealed) and the Cleaning Act (Act No. 72 of 1954, repealed) was 'filth'. And the concept of 'waste' was introduced by the Waste Management and Public Cleansing Act ('Public Cleansing Act': Act No. 137 of 1970) enacted in 1970. 'Waste' was defined as 'filth' and 'disused

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12) Ministry of the Environment Japan, History and Current State of Waste Management in Japan, February 2014.

items'. Subsequently, the Public Cleansing Act was amended to establish regulations that addressed various social problems, including illegal dumping, overcapacity at landfill sites and dioxins.

It was in the 1990s that the standpoint of addressing the problem of resources began to be incorporated into waste-related policies and acts. The enactment of the Act for Promotion of Utilization of Recyclable Resources (currently the Effective Resource Utilization Promotion Act) (1991) was followed by the individual recycling acts, for example, the Containers and Packaging Recycling Act (1995) and the Home Appliance Recycling Act (1998) and so on.

However, the concept of 'waste' remains frozen in time since the enactment of the Public Cleansing Act over 40 years ago and is out of touch with today's trends in many aspects. Therefore it is important in this context that the concept of 'circulative resources' was created in order to ensure a SMC.

Article 2 (2) SMCS Act Definitions of 'waste and others'

(2) In this Act, 'waste and others' are those listed below:

- (i) Waste <sup>13)</sup> ;
- (ii) Articles previously used, articles collected without having been used, or articles disposed of (excluding those currently in use); or, articles derived incidentally in the course of manufacturing, processing, repairing, or selling products, in supplying energy, in construction in civil engineering and architecture, in agricultural and livestock production, and in other human activities (excluding wastes listed in the preceding item).

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13) 'Waste' in the Article refers to 'refuse, bulky refuse, ashes, sludge, excreta, waste oil, waste acid and alkali, carcasses and other filthy and unnecessary matter, which are in solid or liquid state' (Article 2 (1) SMCS Act).

#### **4.3 Future challenges for the use of circulative resources**

The SMCS Act incorporates the concepts of ‘waste and others’ and ‘circulative resources’ and aims to overcome the narrow scope of the traditional concept of waste. These concepts, however, have not been fully coordinated within the Public Cleansing Act and individual recycling acts; therefore challenges remain in achieving consistency between the regulatory structure based on the Public Cleansing Act and the SMCS Act.

It can be said that this has hampered efforts to achieve the original objective of changing the negative view of wastes and looking at waste as a ‘resource’, and presents an obstacle to efforts to promote the cyclical use of resources.

Given the history of the enactment of the Public Cleansing Act, waste is generally assumed to be hazardous, and this partly explains the wide range of regulations established to address it.

In addition, since the administration of the Public Cleansing Act is entrusted to municipalities, decisions made by different municipalities lead to discrepancies. An item may be defined as waste or non-waste. An item may be used as a resource at one location but must be handled as waste at another. This inconsistency is one factor that makes it difficult to apply a unified approach to waste and recycling measures, and efforts to promote the effective use of circulative resources.

### **5. Development of a future sound material-cycle society**

#### **5.1 Needs for a social reform**

Overseas, resources have become an ever more important issue with rapid population increase and the growth of newly emerging economies. Global trends are undergoing major changes as efforts are made to resolve this issue. As economic and social globalisation progresses, resources also need to be



examined from a global perspective<sup>14)</sup>.

While the EU has been moving forward with efforts to improve resource efficiency, Japan has yet to fully coordinate the concepts behind the Public Cleansing Act with those behind the SMCS Act. Challenges still remain in changing people's awareness and society as a whole toward the utilisation of circulative resources with zero waste.

## **5.2 Needs for framework for the safe effective use of resources**

In order to take advantage of useful resources with as little waste as possible, it is important to ensure that all items are handled in ways appropriate to their characteristics. Hazardous items must be managed properly according to their characteristics, whether they are waste or not. If items are not harmful, they must be used in appropriate ways. Items with identical characteristics must be handled in the same manner. By establishing such a framework, it will be possible to make effective use of resources while ensuring safety and public confidence.

Specifically, such a framework involves clarifying the definition of waste, establishing the concept of by-products, and developing standards for the EoW. In studying these concepts and standards, it is important to ask whether they truly contribute to the establishment of a SMC society without being influenced by economic and other factors.

## **5.3 Practical use of voluntary regulations**

Needless to say, true contributions to a SMC society mean putting a priority on ensuring that there is no hazardous impact on human health or the environment; they must be founded on the premise that hazard management

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14) World Business Council for Sustainable Development, Vision 2050: The new agenda for business, February 2010; G7 Ise-Shima Leaders' Declaration, 27 May 2016; Communiqué of G7 Toyama Environment Ministers' Meeting, Toyama Framework on Material Cycles, 16 May 2016.

and quality management are carried out properly. It is important that hazard management and quality management, which are essential components of a SMC society, involve not only conventional government regulations but also the so-called ‘soft’ law or voluntary regulations, such as guidelines and other standards developed by businesses and industry associations<sup>15)</sup>. The management of moving toward a SMC society is also the responsibility of businesses and industry sector<sup>16)</sup>.

Voluntary regulations, for example, must be operated in an appropriate manner by ensuring objectivity through third-party organisations. Effective use of such voluntary efforts may make it possible to balance economic activities and the need for resource conservation more smoothly and contribute to the realisation of sustainable development.

## 6. Conclusion

Based on the above, Japanese law is faced with diverse challenges toward the sustainable management and efficient use of natural resources. The challenges should be valuable also for creating a new ‘tradition’ in its society.

In conclusion, three key points for resource use with zero waste are as follows:

- 1) Clearly define the concept of circulative resources in the SMCS Act relative to the concepts under the Public Cleansing Act and individual recycling acts, and ensure consistency in the legal system. This may involve, for example, establishment of the concept of by-products,
- 2) Help secure high-quality circulative resources by establishing standards for

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15) For example, Keidanren (Japan Business Federation), Voluntary Action Plan on the Environment (Section on the Establishment of a Sound Material-Cycle Society) < <http://www.keidanren.or.jp/en/policy/2016/018.pdf> > [Accessed 10 January 2017].

16) Article 3 and 11 SMCS Act.

the EoW. This entails, for example, the promotion of voluntary programmes by businesses—the establishment and proper operation of standards for which technical aspects are taken into consideration with the involvement of experts,

- 3) Establish appropriate frameworks for management suitable for the characteristics of physical objects. It is important to manage hazardous and harmful items properly, irrespective of whether they are classified as waste or non-waste; if items are deemed neither hazardous nor harmful, they should be put to good use.