Creation of a 3R-Oriented, Sustainable Society

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I  Creation of a 3R-Oriented, Sustainable Society

The Need for Creating a Sustainable Society

In the course of economic activities based on mass-production/consumption/disposal, Japan is facing various problems, such as a shortage of final disposal sites and the adverse environmental effects of hazardous substances, as well as concerns over depletion of mineral resources in the future. These environmental and resource constraints are at the level in which a restriction of economic activities or reduction of the size of the economy would be caused.

(1) Environmental problems

In Japan, as much as 440 million tons of waste is generated every year, and the number of remaining sustainable years of final disposal sites is rapidly dwindling: 13.1 years for general waste and 4.5 years for industrial waste. Under these circumstances, it is necessary to promote measures concerning waste disposal and the 3Rs (reduce, reuse, and recycling).

Furthermore, environmental problems have recently expanded due to industrial pollution on a global level, including long-term environmental effects of hazardous substances such as dioxin, PCB, and endocrine-disrupting chemicals, as well as global warming.

(2) Resource constraints

In the 20th century, human beings mined and consumed limited mineral resources such as oil and metal at a rapid pace. As a result, the current number of sustainable years is about 40 years for oil and about 50 years for copper.

According to the overview of Japan's material balance, Japan utilized about 2.07 billion tons of resources in total, consuming 410 million tons of energy and discharging 580 million tons of waste in producing 1.18 billion tons of products. Most of the 1.04 billion tons of resources accumulated in Japan, which are utilized as roads, bridges, buildings, would be industrial waste in about 10 years.

Meanwhile, the amount of resources that were recycled and reused was about 210 million tons and subsequently remained at a low level, accounting for only slightly over 10% of the total amount of resources utilized.

There is also a "hidden flow" of resources that are byproducts in the process of mining intended resources and discharged as wastes, such as the soil of mountains leveled for the purpose of mining aggregate used for civil engineering and construction, and surface soil or rocks removed for the purpose of mining raw mineral ores. The amount of those resources which are byproducts is estimated at about 740 million tons at home and about 2.88 billion tons abroad.

As outlined above, in order to achieve sustainable development in the 21st century, Japan should take measures in relation to problems concerning waste and enforce the 3Rs as its top priority. It is an urgent task to establish a new economic system that is favorable for both the environment and the economy.

More specifically, for the sustainable development of Japan, it is essential to get out of the conventional economic system that is based on mass-production/consumption/disposal and create a Sustainable economic system and society, while promoting "environmentalization of industry" (incorporating measures for environmental and resource constraints into business activities) and "industrialization of the environment" (generating market value through measures for environmental and resource constraints) through effective use of the power of the private sector.
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Present Situation of Waste in Japan

1. Municipal Solid Waste (MSW)

[1] Total amount of municipal solid waste discharged

The total amount of municipal solid waste discharged (MSW; wastes discharged from households) in FY 2003 was 51.61 million tons, accounting for 139 times as much as the per capita/day amount being 1,106g (see Fig. I-3) in FY 2003 was 

1.106g (see Fig. I-3)

The total amount of MSW discharged and the per capita/day amount of discharge started to increase rapidly around FY 1985, but remained almost flat during the period from FY1989 to FY2003. The downward trend seen after FY1979 was in line with the influence of the second oil shock, and the trend that went upward to reach a peak in FY1990 has flattened and subsequently seems to be in parallel with the bubble economy and its collapse. In the future, however, we should endeavor to reduce waste generation in an economic boom or bust.


In the total amount of MSW treated in FY 2003, 47.4 million tons underwent intermediate treatment by municipalities such as incineration, commendation and selection, while 2.27 million tons were directly delivered to recycling industries, collectively accounting for 96.4% of the total amount of MSW treated (rate of waste reduced in treatment). Out of 47.4 million tons of MSW delivered to intermediate treatment facilities, 4.06 million tons were reused after treatment. The total amount of MSW recycled, the sum of the amount of MSW recycled through intermediate treatment, the amount of MSW directly recycled, and the amount of recyclable resources recovered by citizen groups, was 9.16 million tons. Some 1.86 million tons of MSW were delivered to direct final disposal without going through intermediate treatment (direct landfill) and 36.76 million tons were reduced through intermediate treatment (see Fig. I-4).

The share of MSW directly incinerated in the total amount of MSW treated increased considerably to FY1989 and it has continued to increase slightly since then. The share of MSW recycled through intermediate treatment has also been increasing slightly. Consequently, the share of direct final disposal (final landfill) of MSW has been decreasing (see Fig. I-5).

Notes: 1. The total amount of MSW treated does not correspond to the “amount of scheduled treatment” due to errors in measurement. 
2. Rate of waste reduced in treatment (%) = (direct recycling + (intermediate treatment × treatment residue)) / (total MSW treated) × 100

[Note: Total MSW discharge = MSW collected + MSW directly delivered + MSW treated in-house. According to the "Basic Policy for Comprehensive and Systematic Promotion of Measures for Reduction and Other Proper Treatment of Waste" under the Waste Management Law, the amount of MSW discharged is calculated by deducting the "amount of MSW treated in-house" from the "total amount of MSW discharged" and adding "the amount of recyclable resources collected by citizen groups." Therefore, the amount discharged for FY 2003 is 54.27 million tons.]

Source: Ministry of Environment, Discharge and Treatment of MSW (in FY 2003), November 4, 2005 (revised)
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[3] Recycling
In FY 2003, 2.27 million tons of MSW were separately collected and directly recycled by municipalities, 4.06 million tons were recycled through intermediate treatment, and 2.83 million tons were collected by citizen groups for recycling. The total amount of MSW recycled, aggregating all of the above, was 9.16 million tons (see Fig. I-4). The recycling rate was 16.8%, about 3.7 times higher than FY1989. Fig. I-6 shows that the rise of the recycling rate was accelerated by the effect of the Containers and Packaging Recycling Law that partly came into force in 1997. However, recycling has yet to be promoted sufficiently for some kinds of MSW such as kitchen garbage.

[4] Final disposal sites
As of FY 2003, there were 2,039 final disposal sites for MSW. The remaining-capacity was 137.08 million m³ and the national estimated number of remaining sustainable years was 13.2 years. As the distribution of final disposal sites is regionally uneven, the number of remaining sustainable years may differ among regions (see Fig. I-7).
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[2] Industrial Waste

[1] Total amount of industrial waste discharged

The total amount of industrial waste discharged in Japan in FY 2003 was about 412 million tons, remaining almost flat since FY 1990. The amount of industrial waste recycled has not fluctuated significantly, while the amount of industrial waste reduced through intermediate treatment has been increasing gradually, and therefore the amount of final disposal has been decreasing gradually (see Fig. 1-8).

Based on the estimate by the Ministry of Environment as to the amount of final disposal in FY 2002 (40 million tons) and the remaining capacity of final disposal facilities as of April 2003, the national average number of remaining sustainable years of final disposal facilities is 4.5 years. Thus we are facing a severe situation.

Fig. 1-8 Amount of Industrial Waste Discharged by Industry and Category (FY 2003)

- Amount of discharge (100,000 tons)
- Recycled
- Reduced
- Final disposal

<table>
<thead>
<tr>
<th>Year</th>
<th>Recycled</th>
<th>Reduced</th>
<th>Final disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 2000</td>
<td>39,900</td>
<td>9,800</td>
<td>7,000</td>
</tr>
<tr>
<td>FY 2001</td>
<td>39,800</td>
<td>9,800</td>
<td>7,000</td>
</tr>
<tr>
<td>FY 2002</td>
<td>39,400</td>
<td>9,800</td>
<td>7,000</td>
</tr>
<tr>
<td>FY 2003</td>
<td>39,400</td>
<td>9,800</td>
<td>7,000</td>
</tr>
</tbody>
</table>

Notes: 1. The amount of discharge is the amount in FY 1996 according to the "target amount of waste reduction" set by the government to be achieved by FY 2010 (decided by the government on September 28, 1999) under the Basic Policy for Measures against Pollution (excluding the target amount of waste reduction in FY 2010).
2. The amount of discharge is calculated under the same conditions as 1. above.


Of the total amount of industrial waste discharged (about 412 million tons), about 88 million tons were directly recycled (21%) of the total, and about 308 million tons were delivered to intermediate treatment, which were further reduced to about 128 million tons and then recycled or finally disposed (see Fig. 1-10). Finally, 49% of the total amount of industrial waste discharged was recycled and 7% was finally disposed (see Fig. 1-10).

Fig. 1-10 Flow of Industrial Waste Treatment in Japan (FY 2003)

- Direct recycling: 88 M tons (21%)
- Treatment needed: 129 M tons (32%)
- Reduced: 181 M tons (46%)
- Final disposal after treatment: 15 M tons (4%)

Notes: Intermediate treatment includes the intermediate treatment of industrial waste by category: recycling, reduction, and final disposal. The amount of final disposal was about 181.78 million tons in FY 2002.

[4] Final disposal Sites

As of April 1, 2003, the remaining capacity of final disposal sites for industrial waste was about 181.78 million m³, an increase of about 2.37 million m³ (1%) over the previous year. The national average number of remaining sustainable years of final disposal sites was 4.5 years. (see Fig. 1-11)

Fig. 1-11 Remaining Capacity and Number of Remaining Sustainable Years of Final Disposal Sites for Industrial Waste (thousand m³)

- 2007: 213.009
- 2008: 195.312
- 2009: 187.711
- 2010: 176.089
- 2011: 176.408
- 2012: 181.780

Notes: Number of remaining sustainable years = Remaining capacity by industry of total amount of final disposal (tons) (conversion ratio between ton and m³ = 1)
Legislation and Policies to Promote Creation of a 3R-Oriented Society

1. Legislative System

In the more than ten years since the "Law for Promotion of Utilization of Recycled Resources (amended to the Law for Promotion of Effective Utilization of Resources)" came into force in 1991, practices and policies concerning waste reduction and promotion of recycling have been generally reviewed, and a legislative system is currently being developed in this field. In January 2005, the "End-of-Life Vehicles Recycling Law" came into force (see Fig. II-1).

Fig. II-1 Legislative System for Promoting the Creation of a 3R-Oriented Society

- **Fundamental Law for Establishing a Sound Material-Cycle Society (basic framework law)**
  - Basic principles: Obligations of the national and local governments, businesses and citizens, Measures to be taken by the national government

- **Law for Promotion of Effective Utilization of Resources**
  - Fundamental Plan for Establishing a Sound Material-Cycle Society, Basis of other national plans

- **Proper waste management**
  - Promotion of recycling

- **Waste Management Law**
  - Put into force in January 2001

- **Green Purchasing Law**
  - Put into force in April 2001

- **Containers and Packaging Recycling Law**
  - Put into force in April 2000

- **Home Appliance Recycling Law**
  - Put into force in April 2001

- **Food Recycling Law**
  - Put into force in May 2001

- **Construction Material Recycling Law**
  - Put into force in May 2002

- **End-of-Life Vehicles Recycling Law**
  - Put into force in January 2005

- **Fundamental Law for Establishing a Sound Material-Cycle Society (basic framework law)**
  - Put into force in January 2005

- **Law for Promotion of Effective Utilization of Resources**
  - Put into force in April 2001

- **Home Appliance Recycling Law**
  - Put into force in May 2002

- **Construction Material Recycling Law**
  - Put into force in May 2002

- **End-of-Life Vehicles Recycling Law**
  - Put into force in January 2005

- **Waste Management Law**
  - Put into force in January 2005

Fig. II-2 Legislative System in Line with the Life Cycle of Product

- **Life Cycle of Product**
  - Production
  - Consumption/Use
  - Collection/Recycling

- **Legislative System**
  - Law for Promotion of Effective Utilization of Resources
  - Green Purchasing Law
  - Law for Promotion of Effective Utilization of Resources
  - Containers and Packaging Recycling Law
  - Home Appliance Recycling Law
  - Food Recycling Law
  - Construction Material Recycling Law
  - End-of-Life Vehicles Recycling Law

- **Role of Parties Concerned**
  - Businesses
    - 3R-oriented designs (Resource-saving, Long-life)
    - Reuse, Promoting Recycling
    - Labeling materials
  - National government, national organizations and local authorities:
    - Taking the lead in purchasing environmentally friendly products.
  - Consumers
    - Properly discharging
    - Properly paying, etc.
  - Businesses/Municipalities
    - Properly discharging of waste
Under these laws, as well as the “Guidelines for Waste Treatment and Recycling (By Product Category and Industry Sector)” developed by the METI Industrial Structure Council (see page 38), measures are being taken to cover all types of waste (see Fig. II-3).

For the purpose of controlling environmental pollution caused by business and industrial activities, the Soil Contamination Countermeasures Law was promulgated in 2002 and put into force in January 2003. With respect to chemical substances, the “Law for Promoting Management of Release of Chemical Substances” was promulgated in 1999, and the system for reporting release and transfer of chemical substances was introduced. Under this system, which corresponds to the Pollutant Release and Transfer Register (PRTR) System implemented by the OECD, businesses identify the amount of various kinds of toxic chemical substances released into the environment, as well as the amount of such substances contained in waste and transferred out of their property, and report these amounts to the national government, which gathers and publishes such data.

**2 Fundamental Law for Establishing a Sound Material-Cycle Society**

1. **Subjects to be regulated**
   The law states that it shall be applicable to “waste” in general, valuable or valueless, and that efforts should be made to prevent products from generating waste materials and to promote recycling of such waste materials generated by focusing on their utility as “recyclable resources.”

2. **Parties to be regulated**
   The law attributes responsibility to the national and local governments, businesses and citizens. It clearly stipulates that businesses and citizens shall assume the discharger responsibility, while regarding the extended producer responsibility as a general principle.

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**Legislation and Policies to Promote Creation of a 3R-Oriented Society**

![Diagram showing laws and guidelines to control waste](image-url)

**Fig. II-3 Laws and Guidelines to Control Waste**

- **Municipal solid waste (MSW)**
  - Home appliances: about 2%
  - Furniture: about 2%
  - Others (PCs, gas equipment, etc.): about 2%

- **End-of-Life Vehicle Recycling Law**
  - Vehicles: about 10%

- **Guidelines for Waste Treatment and Recycling by Product Category (Industrial Structure Council)**
  - Containers and packaging: about 25%
  - Packaging: about 10%

- **Food Recycling Law (Business waste only)**
  - Kitchen waste: business establishments: about 35%

- **Recycling material**
  - Electronics: 5%
  - Iron and steel: 8%
  - Chemicals: 5%
  - Electricity, gas, sewage: 22%
  - Agriculture: 12%
  - Other: 10%

**Fig. II-4 Framework of Fundamental Law for Establishing a Sound Material-Cycle Society**

- **Basic principles**
  - Encouraging voluntary and positive implementation of actions to create a sound material-cycle society, thereby promoting the creation of a sustainable society with minimal impact on the environment.
  - Promoting measures in the following order of priority: (1) Reduction of waste generation, (2) Reuse of parts, (3) Recycling of products and containers, (4) Thermal recycling, (5) Proper disposal

- **Basic Plan for establishing a sound material-cycle society**
  - Setting out basic policies for establishing a sound material-cycle society and measures to be taken comprehensively and systematically to this end.

**Outline of the Law**

The law provides for individual roles to be played by citizens, businesses, municipalities and the national government in establishing a sound material-cycle society (see Fig. II-4).

---

**Fig. II-5 Framework of Fundamental Law for Establishing a Sound Material-Cycle Society**

**Establishing a sound material-cycle society**

A sound material-cycle society is a society that realizes a reduction in consumption of natural resources as well as the environmental burden of waste.

1. **Preventing waste generation**
2. **Promoting recycling, reuse, material recycling, thermal recycling, etc. of recyclable resources**

**Basic principles**

- Encouraging voluntary and positive implementation of actions to create a sound material-cycle society, thereby promoting the creation of a sustainable society with minimal impact on the environment.
- Promoting measures in the following order of priority: (1) Reduction of waste generation, (2) Reuse of parts, (3) Recycling of products, (4) Thermal recycling, (5) Proper disposal

**Basic Plan for establishing a sound material-cycle society**

**4 Setting out basic policies for establishing a sound material-cycle society and measures to be taken comprehensively and systematically to this end.**

**Basic policies for establishing a sound material-cycle society**

- Taking measures to reduce waste generation
- Conducting surveys
- Taking economic measures for waste reduction
- Establishing public facilities
- Tackling obstacles to environmental conservation
- Setting up basic policies for establishing a sound material-cycle society and measures to be taken comprehensively and systematically to this end.
(3) Basic Plan for Establishing a Sound Material-Cycle Society

The Basic Plan for Establishing a Sound Material-Cycle Society was developed in March 2003 in comprehensively promoting the policies related to Establishing a Sound Material-Cycle Society as planned.

In this Basic Plan, three indices of different phases of the material flow are defined as “entry”, “recycled” and “exit” toward realization of a Sound Material-Cycle Society in which measures for waste generation restraints, reuse, reuse after treatment, disposal and so forth are well balanced. Based on the past trend with regard to technology innovation and demand structure of goods and services, numerical targets are set as attainable levels when implementing measures with maximum effort based on the basic plan in terms of material cycling.

(1) Material productivity (\(\text{GDP}/\text{Amount of natural resources}\))

With regard to “entry”, an index is defined as “material productivity” representing how effectively material is used (how much affluence is produced with less resources) by industries and people’s life. The numerical target was doubled from FY1990 \([210,000 \text{ yen/t}]\), and aimed at a 40% increase FY2000 \([280,000 \text{ yen/t}]\) in FY2010 \([360,000 \text{ yen/t}]\). In FY2003, the material productivity was 316,000 yen/t.

(2) Usage rate of Recycled Goods (\(\text{Usage rate of recycled goods} / \text{(Usage rate of recycled goods + amount of natural resources used)}\))

With regard to “recycled”, an index is defined as “usage rate of recycled goods” representing how much resources input are cyclically used (reuse and reuse after treatment). The numerical targets are set as follows: a 80% increase from FY1990 \([8\%]\); a 40% increase from FY2000 \([10\%]\); and a 14% increase in FY2010 \([14\%]\). It was 11.3% in FY2003.

(3) Final disposal

With regard to “exit”, an index is defined as “amount of final disposal” (land-filled waste) representing an urgency in need of final disposal sites. The numerical targets are set as follows: a 75% decrease from FY1990 \([110M \text{ tn.}]\); a 50% decrease from FY2000 \([56M \text{ tn.}]\); and 28 million tons in FY2010. The amount of final disposal was 40 million tons in FY2003.

(4) Extended producer responsibility

In discussions on 3R-related policies and systems, “Extended Producer Responsibility (EPR)” is often used. Extended producer responsibility means that producers bear a certain degree of responsibility for proper recycling and management of the products that they produced even after the products are used and disposed of.

More specifically, in order to contribute to prevention of waste generation as well as recycling and proper disposal of recyclable resources, producers are required to [1] design recycling-oriented products, [2] indicate the materials or ingredients of products, and [3] take back and recycle designated products after they are disposed of.

Having studied extended producer responsibility as an environmental policy approach since 1994, the OECD developed and published a guidance manual for OECD members in 2001.

Table II-1 Extended Producer Responsibility under the OECD “Extended Producer Responsibility: Guidance Manual for Governments”

| [1] Definition | “An environmental policy approach in which a producer’s responsibility, physical and/or financial, for a product is extended to the post-consumer stage of a product’s life cycle”. This approach has the following features:
| a) The responsibility is transferred from local governments to the producer. |
| b) Producers consider the environmental impact when designing their products. |
| [2] Primary effect | Transfer the financial and/or physical responsibility of waste management from local governments and the general taxpayer to the producer, encourage positive changes in material selection and in the design aspects of a product. Appropriate signals can be sent to the producer to internalize a substantial portion of the external environmental cost of the product. |
| [3] Major Objective | (a) Source reduction (natural resource conservation/material conservation) |
| (b) Waste prevention |
| (c) Design of more environmentally compatible products |
| (d) Closure of material-use loops to promote sustainable development |
| [4] Sharing responsibility | Sharing responsibility among parties concerned in the product chain from production to disposal is an inherent key of EPR. |
| [5] Specific policy instruments and measures | (a) Take-back and recycling of products |
| (b) Deposit/refund scheme |
| (c) Material taxes as earmarked taxes |
| (d) Advance disposal fee |
| (e) Criteria for users of recycled products |
| (f) Leasing |
| [6] EPR and PPP | The Polluter Pays Principle (PPP) states that the polluter should bear the expenses of preventing and controlling pollution to ensure that the environment is in an acceptable state. In contrast, EPR seeks to solve problems by holding producers responsible for the entire life cycle of a product. Inconsistency between EPR and PPP can be completely prevented by clearly defining their roles. |

3 Law for Promotion of Effective Utilization of Resources

[1] Title of the law: Law for Promotion of Effective Utilization of Resources
[3] Purpose: Comprehensively promoting reduction of waste, reuse of parts, and recycling of used products as raw materials

Outline of the Law
The law provides for measures to be taken by businesses, such as 3R-related measures in the production stage, 3R consideration in the product designing stage, labeling for separated collection, and development of a system for self-collection and recycling by manufacturers.

1) Responsibilities of parties concerned

[1] Businesses
- Rationalize use of raw materials with the aim of reducing used products and by-products.
- Using recyclable resources and reusable parts
- Promoting the use of used products and by-products as recyclable resources and reusable parts

- “Recyclable resources”: Used products or by-products (waste) generated in plants that can be used as raw materials
- “Reusable parts”: Used goods that can be used as the parts or part of the products

[2] Consumers
- Using products as long as possible
- Using products containing recyclable resources
- Cooperating for separated collection

[3] National and local governments
- Taking financial measures
- Promoting the use of recyclable resources in procurement
- Promoting science and technology development
- Endeavoring to gain the understanding of the public

2) Industries and products to be regulated

The law requires that businesses take measures to apply the 3Rs (reduction, reuse and recycling) under specific criteria (ministerial ordinances) with respect to 10 designated/specified industries and 69 product items (covering about 50% of municipal and industrial waste).

Legislation and Policies to Promote Creation of a 3R-Oriented Society

1) Designated resources-saving industry
- Required to reduce generation of by-products (by ensuring rational use of raw materials and promoting use of by-products as recyclable resources)
- Pulp and paper
- Primary copper smelting and refining
- Automobile manufacturing (including motorized bicycle manufacturing)
- Inorganic chemical manufacturing (excluding salt manufacturing) and organic chemical manufacturing
- Iron-making and steel-making/rolling

2) Designated resources-reutilizing industry
- Required to use recyclable resources and reusable parts
- Paper manufacturing
- Glass container manufacturing
- Construction
- Rigid PVC pipes and pipe fitting manufacturing
- Copier manufacturing

3) Specified resources-saved product
- Required to ensure rational use of raw materials, prolonging product life and reduce generation of used products
- Automobiles
- Home appliances (televisions, air conditioners, refrigerators, washing machines, microwave ovens, clothes dryers)
- Personal computers (including CRTs and liquid crystal displays)
- Pachinko machines (including rotary types)
- Metal furniture (metal storage furniture, shelves, office desks and swivel chairs)
- Gas and oil appliances (oil heaters, gas cookers with grills, switch-on gas water heaters, bath heaters with gas burners, oil-fired water heaters)
- Copying machines
- Bathroom units and kitchen systems

4) Specified reuse-promoted product
- Required to promote the use of recyclable resources or reusable parts (designing and manufacturing products that can be easily reused or recycled)
- Automobiles
- Home appliances (televisions, air conditioners, refrigerators, washing machines, microwave ovens, clothes dryers)
- Personal computers (including CRTs and liquid crystal displays)
- Pachinko machines (including rotary types)
- Gas and oil appliances (oil heaters, gas cookers with grills, switch-on gas water heaters, bath heaters with gas burners, oil-fired water heaters)
- Copying machines
- Bathroom units and kitchen systems
Legislation and Policies to Promote Creation of a 3R-Oriented Society

- Devices using compact rechargeable batteries
  - Electric power supply devices, power tools, guide lights, fire alarm systems, security alarm devices, electric-assisted bicycles, electric-powered wheelchairs, printers, portable data collecting devices, cordless phones, facsimile devices, telephone switchboards, communication devices for mobile phones, communication devices for MCA systems, communication devices for simplicity radio transmission, radio sets for amateurs, video cameras, headphone stereos, electric vacuum cleaners, electric shavers, electric therapeutic apparatuses, electric bubble generators, electric toys

- Specified labeled product
  - Steel cans, aluminum cans (beverages and liquors)
  - PET bottles (beverages, liquors, soy sauce)

- Specified resource-recycled products
  - Required to promote self-collection and recycling
    - Compact rechargeable batteries
      - Compact sealed lead batteries, sealed nickel-cadmium batteries, sealed nickel-metal-hydride batteries, lithium batteries
    - Personal computers
      - Including CRTs and liquid crystal displays

- Specified by-product
  - Required to promote the use of by-products as recyclable resources
    - Coal ash generated by the electricity industry
    - Soil and sand, concrete lumps, asphalt-concrete lumps or lumbers generated by the construction industry
4 Waste Management Law

[3] Purpose: To preserve the living environment and improve public health by preventing waste generation, promoting proper waste management (transportation, disposal, recycling, etc.) and maintaining a clean living environment.

Outline of the Law

The law provides for the definition of waste, permission for engaging in the waste disposal business, permission for establishing waste disposal facilities, and setting of the waste disposal criteria (see Fig. II-8).

(1) Definition of waste

The law defines "waste" as "refuse, bulky refuse, ashes, sludge, excreta, waste oil, waste acid, waste alkali, carcasses and other filthy and unnecessary matter, which are in solid or liquid state." In other words, "waste" means things that become useless because they can no longer be used by their owners or sold to others for value.

Whether a thing falls under the definition of waste is comprehensively judged in light of its nature, the condition of its discharge, the ordinary way of handling it, whether it has any commercial value, and its owner's intention. For example, if used tires are piled up in an open field and left untouched for as long as about 180 days, they are regarded as waste.

Among waste materials discharged in business activities, 20 kinds of waste materials, such as ashes, sludge, animal excrement discharged in the livestock industry, waste oil, waste acid, waste alkali, and animal bodies discharged in the livestock industry, are defined as industrial waste, and other kinds of waste materials are defined as municipal solid waste.

(2) Responsibilities of businesses

[1] Businesses shall bear the responsibility of properly managing waste materials generated in their activities or entrust such management in writing to licensed waste disposal businesses.
[2] Businesses are also required to follow the flow of waste materials that they discharge until their final disposal in accordance with the "Manifest" (waste management sheet).
[3] Businesses discharging a vast quantity of waste (businesses that discharged 1,000 tons or more of industrial waste or 50 tons or more of specially controlled industrial waste in the previous year) need to develop a waste disposal plan.

(3) Permission of disposal facilities

Businesses shall obtain permission for establishing a waste disposal facility under this law even in the case of engaging in waste management, whether it has any commercial value, or its owner's intention. For example, if used tires are piled up in an open field and left untouched for as long as about 180 days, they are regarded as waste.

Among waste materials discharged in business activities, 20 kinds of waste materials, such as ashes, sludge, animal excrement discharged in the livestock industry, waste oil, waste acid, waste alkali, and animal bodies discharged in the livestock industry, are defined as industrial waste, and other kinds of waste materials are defined as municipal solid waste.

(2) Responsibilities of businesses

[1] Businesses shall bear the responsibility of properly managing waste materials generated in their activities or entrust such management in writing to licensed waste disposal businesses.
[2] Businesses are also required to follow the flow of waste materials that they discharge until their final disposal in accordance with the "Manifest" (waste management sheet).
[3] Businesses discharging a vast quantity of waste (businesses that discharged 1,000 tons or more of industrial waste or 50 tons or more of specially controlled industrial waste in the previous year) need to develop a waste disposal plan.

(3) Permission of disposal facilities

Businesses shall obtain permission for establishing a waste disposal facility under this law even in the case of engaging in waste management provided under the Home Appliance Recycling Law or the Containers and Packaging Recycling Law.

(4) Special schemes

Licenses for engaging in a waste disposal business or establishing waste disposal facilities shall not be required under two special schemes, National Permit System and the Disposal and Recycling Approval Scheme (see Table II-2).

The National Permit System was created as an enhanced version of the original Wide-Area Disposal and Recycling Designation Scheme, with the aim of promoting better waste management (based on the amended law, which entered into effect on 1 December, 2003).
Legislation and Policies to Promote Creation of a 3R-Oriented Society

5 Containers and Packaging Recycling Law

(1) Overview

[3] Purpose: Clarifying the role-sharing in managing waste of containers and packaging discharged as MSW from households, i.e., consumers setting waste materials when discarding them, municipalities carrying out sorted collection, and businesses recycling collected waste, with the aim of ensuring proper management of waste and effective use of resources through reduction of MSW and adequate use of recyclable resources.

Outline of the Law

The law provides for a collection and recycling system in which municipalities take charge of carrying out sorted collection of containers and packaging (sorted and discarded by consumers) and businesses take charge of recycling such collected containers and packaging (see Figs. II-10 and II-11).

(1) Containers and packaging

“Containers” means things in which products are contained (including bags), and “packaging” means things used to wrap products.

The Containers and Packaging Recycling Law defines containers and packaging as “containers and packaging for commercial products, which become unnecessary when the said products have been consumed or when the said containers and packaging have been removed from the products.”

(2) Containers and packaging subject to the law

“Containers” subject to the law include glass containers, PET bottles, paper containers, plastic containers (including system of trays and plastic bags), and “packaging” subject to the law includes collection and packaging materials, all of which are discharged from households, under the following conditions:

[1] Those that can generally be regarded as containers or packaging, based on socially accepted ideas, shall be subject to the law.

Examples: Cans of PET bottles, covers of pudding cups, wrapping film used for food trays

[2] Those used for providing services rather than used as containers or packaging

Examples: CD cases, camera cases

[3] Those that are still necessary even when the products are removed from them shall be excluded.

Examples: CD cases, camera cases

(3) Businesses to be regulated

The law specifies that businesses (manufacturers/users) that are to be regulated are obliged to recycle containers and packaging.

(2) Containers and packaging subject to the law

Containers and packaging subject to the law include glass bottles, PET bottles, paper containers, and plastic containers (including system of trays and plastic bags), and “packaging” subject to the law includes collection and packaging materials, all of which are discharged from households, under the following conditions:

[1] Those that can generally be regarded as containers or packaging, based on socially accepted ideas, shall be subject to the law.

Examples: Cans of PET bottles, covers of pudding cups, wrapping film used for food trays

[2] Those used for providing services rather than used as containers or packaging

Examples: CD cases, camera cases

(3) Businesses to be regulated

The law specifies that businesses (manufacturers/users) that are to be regulated are obliged to recycle containers and packaging.

Fig. II-10 Three Recycling Routes

Fig. II-11 Scheme under the Containers and Packaging Recycling Law (Designated body route: PET bottles)

Fig. II-12 Methods for Recycling Waste from Containers and Packaging under the Recycling Obligation

---

* Steel cans, aluminum cans, paper cartons, and composted cardboard are subject to the Containers and Packaging Recycling Law, but they have yet to be subject to the recycling obligation.
Of a total of 3,053 municipalities in Japan (as of October 1, 2004 includingTokyo 23 wards), the number of those carrying out sorted collection and recycling under the Containers and Packaging Recycling Law has been increasing steadily, mainly with respect to the items included in the scope of regulation by the law in 1997 (see Fig. II-13). The ratio of municipalities carrying out sorted collection and recycling to the total number of municipalities in FY2004 was 92% for glass bottles, 25% for paper containers/packaging, 92% for PET bottles and 58% for plastic containers/packaging; all of these four items being subject to the sorted collection and recycling under the law.

The volume of PET bottles collected separately in FY2004 was 334,659 tons (see Fig. II-14), of which the collection rate exceeded 62% by adding 810,000 tons (data provided by a manufactures association) collected in FY2003, of which 27,000 tons and 310,000 tons (see Fig. II-16(e)(f)) were those recycled was 60,000 tons and 455,000 tons (see Fig. II-15), while the volume of those recycled was 60,000 tons and 455,000 tons (see Fig. II-15), of which 27,000 tons and 310,000 tons (see Fig. II-16 (c)(f)) were recycled and sold via the designated body, respectively.

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II

Fig. II-13 Number of Municipalities Carrying Out Sorted Collection

<table>
<thead>
<tr>
<th>Year</th>
<th>Colorless glass bottles</th>
<th>Amber glass bottles</th>
<th>Glass bottles of other colors</th>
<th>Paper containers/packaging</th>
<th>PET bottles</th>
<th>Plastic containers/packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY1997</td>
<td>54,041</td>
<td>2,683</td>
<td>1,757</td>
<td>1,175</td>
<td>931</td>
<td>208</td>
</tr>
<tr>
<td>FY1998</td>
<td>72,865</td>
<td>3,352</td>
<td>2,024</td>
<td>1,624</td>
<td>1,259</td>
<td>228</td>
</tr>
<tr>
<td>FY1999</td>
<td>90,690</td>
<td>4,021</td>
<td>2,683</td>
<td>1,971</td>
<td>1,446</td>
<td>248</td>
</tr>
<tr>
<td>FY2000</td>
<td>108,514</td>
<td>4,660</td>
<td>3,298</td>
<td>2,302</td>
<td>1,653</td>
<td>268</td>
</tr>
<tr>
<td>FY2001</td>
<td>126,338</td>
<td>5,257</td>
<td>3,975</td>
<td>2,638</td>
<td>1,834</td>
<td>288</td>
</tr>
<tr>
<td>FY2002</td>
<td>144,162</td>
<td>5,855</td>
<td>4,641</td>
<td>2,952</td>
<td>2,002</td>
<td>308</td>
</tr>
<tr>
<td>FY2003</td>
<td>161,987</td>
<td>6,452</td>
<td>5,308</td>
<td>3,263</td>
<td>2,169</td>
<td>328</td>
</tr>
<tr>
<td>FY2004</td>
<td>179,811</td>
<td>7,060</td>
<td>6,075</td>
<td>3,576</td>
<td>2,326</td>
<td>348</td>
</tr>
</tbody>
</table>

Source: Ministry of Environment

Fig. II-14 Volume of Containers and Packaging Collected

<table>
<thead>
<tr>
<th>Year</th>
<th>Colorless glass bottles</th>
<th>Amber glass bottles</th>
<th>Glass bottles of other colors</th>
<th>Paper containers/packaging</th>
<th>PET bottles</th>
<th>Plastic containers/packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY1997</td>
<td>37,191</td>
<td>1,760</td>
<td>1,240</td>
<td>989</td>
<td>73</td>
<td>170</td>
</tr>
<tr>
<td>FY1998</td>
<td>77,776</td>
<td>3,270</td>
<td>2,540</td>
<td>1,987</td>
<td>133</td>
<td>230</td>
</tr>
<tr>
<td>FY1999</td>
<td>118,197</td>
<td>4,740</td>
<td>4,040</td>
<td>2,695</td>
<td>174</td>
<td>270</td>
</tr>
<tr>
<td>FY2000</td>
<td>158,618</td>
<td>5,510</td>
<td>5,390</td>
<td>3,468</td>
<td>210</td>
<td>280</td>
</tr>
<tr>
<td>FY2001</td>
<td>199,039</td>
<td>6,310</td>
<td>6,880</td>
<td>4,039</td>
<td>241</td>
<td>300</td>
</tr>
<tr>
<td>FY2002</td>
<td>239,459</td>
<td>7,120</td>
<td>8,470</td>
<td>4,699</td>
<td>271</td>
<td>320</td>
</tr>
<tr>
<td>FY2003</td>
<td>280,120</td>
<td>7,950</td>
<td>10,470</td>
<td>5,468</td>
<td>302</td>
<td>340</td>
</tr>
<tr>
<td>FY2004</td>
<td>320,781</td>
<td>8,790</td>
<td>12,540</td>
<td>6,369</td>
<td>332</td>
<td>360</td>
</tr>
</tbody>
</table>

Source: Ministry of Environment

Fig. II-15 Volume of Containers and Packaging Recycled (Volume of Those Delivered to Recycling Businesses)

<table>
<thead>
<tr>
<th>Year</th>
<th>Colorless glass bottles</th>
<th>Amber glass bottles</th>
<th>Glass bottles of other colors</th>
<th>Paper containers/packaging</th>
<th>PET bottles</th>
<th>Plastic containers/packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY1997</td>
<td>77,159</td>
<td>2,683</td>
<td>1,175</td>
<td>931</td>
<td>208</td>
<td>60</td>
</tr>
<tr>
<td>FY1998</td>
<td>97,747</td>
<td>2,911</td>
<td>1,446</td>
<td>1,834</td>
<td>228</td>
<td>80</td>
</tr>
<tr>
<td>FY1999</td>
<td>117,303</td>
<td>3,298</td>
<td>2,002</td>
<td>2,326</td>
<td>248</td>
<td>100</td>
</tr>
<tr>
<td>FY2000</td>
<td>136,473</td>
<td>3,641</td>
<td>2,638</td>
<td>2,659</td>
<td>268</td>
<td>120</td>
</tr>
<tr>
<td>FY2001</td>
<td>155,639</td>
<td>4,172</td>
<td>3,192</td>
<td>3,169</td>
<td>288</td>
<td>140</td>
</tr>
<tr>
<td>FY2002</td>
<td>174,808</td>
<td>4,699</td>
<td>3,776</td>
<td>3,576</td>
<td>308</td>
<td>160</td>
</tr>
<tr>
<td>FY2003</td>
<td>194,002</td>
<td>5,226</td>
<td>4,304</td>
<td>4,039</td>
<td>328</td>
<td>180</td>
</tr>
<tr>
<td>FY2004</td>
<td>213,197</td>
<td>5,780</td>
<td>5,458</td>
<td>4,699</td>
<td>358</td>
<td>200</td>
</tr>
</tbody>
</table>

Source: Ministry of Environment

Fig. II-16 Trends in the Volume of Containers and Packaging Recycled via the Designated Body and the Use of Recycled Products

(a) Colorless glass bottles

<table>
<thead>
<tr>
<th>Year</th>
<th>Volume (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>34,905</td>
</tr>
<tr>
<td>1998</td>
<td>33,038</td>
</tr>
<tr>
<td>1999</td>
<td>32,168</td>
</tr>
<tr>
<td>2000</td>
<td>31,617</td>
</tr>
<tr>
<td>2001</td>
<td>30,877</td>
</tr>
<tr>
<td>2002</td>
<td>29,736</td>
</tr>
<tr>
<td>2003</td>
<td>28,496</td>
</tr>
<tr>
<td>2004</td>
<td>27,184</td>
</tr>
</tbody>
</table>

(b) Amber glass bottles

<table>
<thead>
<tr>
<th>Year</th>
<th>Volume (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>98,374</td>
</tr>
<tr>
<td>1998</td>
<td>93,749</td>
</tr>
<tr>
<td>1999</td>
<td>90,555</td>
</tr>
<tr>
<td>2000</td>
<td>87,429</td>
</tr>
<tr>
<td>2001</td>
<td>84,752</td>
</tr>
<tr>
<td>2002</td>
<td>82,858</td>
</tr>
<tr>
<td>2003</td>
<td>80,577</td>
</tr>
<tr>
<td>2004</td>
<td>78,583</td>
</tr>
</tbody>
</table>

*The description of bottle to bottle is revised as "raw materials for glass bottle" as of FY2003.
6 Home Appliance Recycling Law

(1) Overview


(2) Purpose: Clarifying the role-sharing between consumers, retailers and home appliance manufacturers in managing used home appliances disposed of by households, with the aim of promoting waste reduction and recycling.

Outline of the law

The law provides for a collection and recycling system in which home appliance retailers take charge of collecting used home appliances and home appliance manufacturers take charge of recycling collected appliances (see Fig. II-17).

(1) Home appliances to be regulated

[1] Air conditioners
[2] Television sets (limited to CRT-types)
[3] Refrigerators, freezers

(2) Recycling

"Recycling" means removing parts and materials from used home appliances and reusing them as parts or raw materials for new products or assigning them, with or without charge, to those who will reuse them. "Recycling" includes thermal recycling or using waste as fuel. However, it is currently required to satisfy a certain recycling level: only in terms of recycling of waste as parts or raw materials of new products.

Recycling level required under the law

The recycling level is determined based on the weight of parts, materials or new products or raw materials that are recycled or reused. The recycling level is expressed as a percentage of the weight of materials recycled to the weight of units treated for recycling.

### Recycling level

- **Air conditioner**: 60%
- **Refrigerator-freezer**: 55%
- **Television set**: 50%
- **Refrigerator**: 50%
- **Freezer**: 30%
- **Washing machine**: 30%

### Recycling rate

- **Air conditioner**: 25%
- **Refrigerator-freezer**: 75%
- **Television set**: 35%
- **Refrigerator**: 25%
- **Freezer**: 15%
- **Washing machine**: 15%

### Recycling fees

- **Air conditioner**: 6,466 yen
- **Refrigerator-freezer**: 11,783 yen
- **Television set**: 7,120 yen
- **Refrigerator**: 5,454 yen
- **Freezer**: 3,944 yen
- **Washing machine**: 2,530 yen

### Payment of costs for collection and recycling

- **air conditioners**: Consumers
- **refrigerators/freezers**: Home appliance retailers
- **television sets**: Home appliance retailers and home appliance manufacturers
- **washing machines**: Home appliance manufacturers

### Responsibilities of parties concerned

(1) Consumers (Those who use home appliances shall pay for recycling costs.)
- Appropriate disposal
  - Payment of costs for collection and recycling
(2) Home appliance retailers (Those who sell home appliances shall collect and transport them.)
- Taking back home appliances, which they have sold, from businesses that dispose of them
- Taking back home appliances at the request of customers who buy new ones to replace old ones and proper delivering of collected home appliances to the manufacturers and importers
(3) Home appliance manufacturers and importers (Those who manufacture home appliances shall recycle them.)
- Issuing home appliance recycling coupons to manufacturers and the designated body and sending copies to dischargers
- Displaying the costs of collecting and transporting in shop windows
(4) Recycling bodies (Association for Electric Home Appliances)
- Recycling home appliances whose manufacturers are unknown or those entrusted by specific manufacturers (manufacturers whose production volume is less than 900,000 units for air conditioners, 900,000 units for television sets, 450,000 units for refrigerators, and 450,000 units for washing machines)
(5) Municipalities
- Delivering home appliances, which they have collected, to manufacturers and the designated body, as well as recycling them

---

*1 Refrigerators became subject to the regulation as of April 2004.
*2 Recycling rate = Weight of units treated for recycling / Weight of materials recycled
*3 Association for Electric Home Appliances operates the home appliance recycling coupon system, which is convenient for paying and collecting recycling fees. Recycling fees may be paid and collected via retailers or by postal transfer.
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(2) Present Situation of Recycling

Among used home appliances disposed of by households, about 18 million units of air conditioners, television sets, refrigerators and washing machines, the four items included in the scope of regulation by the law in April 2001, were disposed of annually at the time of enforcement of the law. Up to now, it is estimated that 70.8% of such used home appliances are treated and disposed of as waste, 4.9% are sold in Japan as second-hand goods and 24.3% are exported as second-hand goods.

Since the law was put into force, the four items have been taken back by retailers or municipalities, and then recycled by manufacturers/importers or the designated body (Association for Electric Home Appliances) at 45 recycling plants for home appliances.

In FY 2004, manufacturers/importers or the designated body took back a total of about 11.22 million units (7.2% increase compared to the previous year) of the four items at take-back sites, and the recycling rates for the four items were 64% to 82% (see Fig. II-18). All these recycling rates exceeded the target levels under the Home Appliance Recycling Law (see page 27).

With regard to the composition of the weight of materials recycled, iron, copper, aluminum and glass account for the majority of the total although depending on products (see Fig. II-19 and II-20). CFCs used as refrigerants for air conditioners, and refrigerators/freezers and CFCs in the heat insulator of refrigerators/freezers are also collected and decomposed.

The ratio of home appliances illegally discarded to the number of units taken back has varied between 1% and 2% during the last few years (see Fig. II-21). The total number of the four items illegally discarded in April - September 2004 was 172,327 (2,526 municipalities, 128.42 million people: 99% of total population). This was a decrease of 0.2% compared to the same term of the previous year. Continued investigation of the actual situation is needed.

Fig. II-17 Flow of Recycling of Used Home Appliances

<table>
<thead>
<tr>
<th>Disposers</th>
<th>(44 million households, 18 million units / year [four items])</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optional disposal</td>
<td>Payment of cost for collection and recycling</td>
</tr>
<tr>
<td>Obligation to take back</td>
<td>Retailers</td>
</tr>
<tr>
<td>80,000 home appliance stores (5,500 large stores)</td>
<td></td>
</tr>
<tr>
<td>Obligation to deliver</td>
<td></td>
</tr>
<tr>
<td>Designated take-back sites</td>
<td></td>
</tr>
<tr>
<td>45 recycling plants</td>
<td></td>
</tr>
<tr>
<td>Obligation to take back</td>
<td></td>
</tr>
<tr>
<td>380 designated take-back sites</td>
<td></td>
</tr>
<tr>
<td>Obligation to recycle used home appliances according to the recycling criteria</td>
<td></td>
</tr>
</tbody>
</table>

Fig. II-18 Recycling by Manufacturers/Importers and the Designated Body (FY2004)

<table>
<thead>
<tr>
<th>Item</th>
<th>Number of units taken back at designated take-back sites</th>
<th>Number of units treated for recycling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air conditioners</td>
<td>103,306</td>
<td>164,313</td>
</tr>
<tr>
<td>Television sets</td>
<td>85,764</td>
<td>130,179</td>
</tr>
<tr>
<td>Refrigerators</td>
<td>103,046</td>
<td>164,313</td>
</tr>
<tr>
<td>Washing machines</td>
<td>60,818</td>
<td>130,179</td>
</tr>
</tbody>
</table>

Fig. II-19 Weight of Materials Recycled by Manufacturers/Importers and the Designated Body (FY2004)

<table>
<thead>
<tr>
<th>Material</th>
<th>Air conditioners</th>
<th>Television sets</th>
<th>Refrigerators</th>
<th>Washing machines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>3,835</td>
<td>3,835</td>
<td>3,835</td>
<td>3,835</td>
</tr>
<tr>
<td>Aluminum</td>
<td>183</td>
<td>183</td>
<td>183</td>
<td>183</td>
</tr>
<tr>
<td>Iron</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Plastic</td>
<td>3,500</td>
<td>3,500</td>
<td>3,500</td>
<td>3,500</td>
</tr>
<tr>
<td>Others</td>
<td>3,500</td>
<td>3,500</td>
<td>3,500</td>
<td>3,500</td>
</tr>
</tbody>
</table>

Fig. II-20 Composition of Home Appliances

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight (ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air conditioners</td>
<td>60,000</td>
</tr>
<tr>
<td>Refrigerators</td>
<td>30,000</td>
</tr>
<tr>
<td>Washing machines</td>
<td>20,000</td>
</tr>
<tr>
<td>Others</td>
<td>10,000</td>
</tr>
</tbody>
</table>

Fig. II-21 Trends in the Number of Units Illegally Discarded (total of four items)

<table>
<thead>
<tr>
<th>Month</th>
<th>Units (thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb.</td>
<td>1.2</td>
</tr>
<tr>
<td>Mar.</td>
<td>1.3</td>
</tr>
<tr>
<td>Apr.</td>
<td>1.4</td>
</tr>
<tr>
<td>May</td>
<td>1.5</td>
</tr>
<tr>
<td>Jun.</td>
<td>1.6</td>
</tr>
<tr>
<td>Jul.</td>
<td>1.7</td>
</tr>
<tr>
<td>Aug.</td>
<td>1.8</td>
</tr>
<tr>
<td>Sep.</td>
<td>1.9</td>
</tr>
<tr>
<td>Oct.</td>
<td>2.0</td>
</tr>
<tr>
<td>Nov.</td>
<td>2.1</td>
</tr>
<tr>
<td>Dec.</td>
<td>2.2</td>
</tr>
</tbody>
</table>

Source: Ministry of the Environment
7 End-of-Life Vehicle Recycling Law

(1) Vehicles to be regulated
All types of four-wheel vehicles (including large vehicles and commercial vehicles, such as trucks and buses)

(2) Responsibilities of the parties concerned
[1] Car owners (end users)
  Payment of recycling fee, delivering end-of-life vehicles to ELV-collecting businesses that are registered with local authorities
[2] ELV - collecting businesses
  Taking back ELVs from end users and then delivering them to CFC-collecting businesses and auto - dismantling businesses.
[3] CFC - collecting businesses
  Collecting fluorocarbons properly from ELVs in accordance with the recycling standards, handing over ELVs to car manufacturers/importers

(3) Payment of recycling fee
[1] Fees shall be paid upon purchasing new cars for those who purchase new cars from January 2005, and paid at the first periodic inspection of every in-use vehicle from January 2005 for those who already purchased cars by the end of 2004. In the case of disposing of cars without undergoing a periodic inspection, fees shall be paid to ELV - collecting businesses when ELVs are handed over to them.
[2] Recycling fees are determined on every car by individual car manufacturers/importers, depending on the possible quantity of shredder dust and CFCs, number of airbags and simplicity of taking off airbags.
[3] The average fee for recycling shall be disclosed by car manufacturers/importers, depending on the possible quantity of shredder dust and CFCs, number of airbags and simplicity of taking off airbags.

(4) Auto dismantling businesses
Dismantling ELVs properly in accordance with the recycling standards, collecting airbags and handing over ELVs to car manufacturers/importers

(5) Shredding businesses
Shredding dismantled ELVs (press, cutting and shredding) in accordance with the recycling standards, handing over shredder dust (waste remaining after shredding dismantled ELVs) to car manufacturers/importers

[6] Car manufacturers/importers
  Collecting and recycling CFCs, airbags and shredder dust from ELVs that are manufactured and imported by themselves.

(3) Payment of recycling fee
[1] Fees shall be paid upon purchasing new cars for those who purchase new cars from January 2005, and paid at the first periodic inspection of every in-use vehicle from January 2005 for those who already purchased cars by the end of 2004. In the case of disposing of cars without undergoing a periodic inspection, fees shall be paid to ELV - collecting businesses when ELVs are handed over to them.
[2] Recycling fees are determined on every car by individual car manufacturers/importers, depending on the possible quantity of shredder dust and CFCs, number of airbags and simplicity of taking off airbags.
[3] The average fee for recycling shall be disclosed by car manufacturers/importers, or http://www.jars.gr.jp for automobile recycling system.

*1 including car owners already registered
*2 Third parties shall be involved in case of absence of a party responsible for recycling. Additionally, financial support for measures for island areas and illegal disposal is implemented.

Source: Ministry of Economy, Trade and Industry
8 Construction Material Recycling Law

(1) Construction works to be regulated

Type of construction | Standard size
--- | ---
Demolition of a building | 800m² or more (total floor space)
Construction of a new building or extension | 500m² or more (total floor space)
Repairing or remodeling (renovating) of a building | 100m² or more (contracting fee)
Other construction work (civil engineering work) | 50m² or more (contracting fee)

Notes:
1. Demolition work means demolishing parts of a building, such as the foundation, foundation piles, walls, posts, roof trusses, joists, diagonal framing, floor covers, roof plates or horizontal framing, which support the weight of the building or its live load, snow, wind pressure, earth pressure or hydrostatic pressure, or earthquake or other vibration or impact.
2. Work for demolishing part of a building or constructing part of a new building or extension shall be subject to the regulation if the total floor area of the part concerned falls under the standard size. Reconstruction work shall be regarded as a combination of demolition and construction of a new building (or extension).

(2) Construction materials to be regulated (As of the end of October 2005)

- Concrete
- Construction materials consisting of concrete and iron
- Wood
- Asphalt concrete

* It is allowable to reduce (incinerate) wood if the construction site is more than 50 km away from the nearest recycling facility.

These materials account for about 80% of the total amount of construction waste (see Fig. II-24).

Fig. II-24 Amount of Construction Waste Discharged, by Product Category (FY2002)

<table>
<thead>
<tr>
<th>Product Category</th>
<th>Amount (Million Tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete masses</td>
<td>80 million tons</td>
</tr>
<tr>
<td>Asphalt masses</td>
<td>30 million tons</td>
</tr>
<tr>
<td>Concrete mass</td>
<td>20 million tons</td>
</tr>
<tr>
<td>Wood generated in construction</td>
<td>5 million tons</td>
</tr>
<tr>
<td>Others (metal scraps, plastics waste, paper waste)</td>
<td>1 million tons</td>
</tr>
<tr>
<td></td>
<td>Total 103 million tons</td>
</tr>
</tbody>
</table>

Fig. II-25 Relationship Between Construction By-products, Recycled Resources and Waste

- Recycled resources (Law for Promotion of Effective utilization of Resources)
  - Products that can be used directly as raw materials
  - Products that can be used as resources
  - Recycled aggregate
  - Recycled asphalt mix beams
  - Slag from concrete
  - Iron slag

- Construction by-products (Waste Management Law)
  - Materials that can be used as resources
  - Masses of concrete
  - Masses of asphalt and concrete
  - Wood generated from construction
  - Infectious substances and dangerous objects

Recycling of these items is mandatory under the Construction Material Recycling Law.

Fig. II-26 Flow of Sorted Demolition and Recycling

- Client
  - Prior notification
  - Change order
  - Implementation of sorted demolition

- Contractor
  - Prime contractor
  - Subcontractor
  - Ready-mixed concrete plant

- Recycled resources
  - High-quality aggregate
  - Road-bed materials

- Final disposal
  - Illegal dumping
  - Proper disposal

Fig. II-27 Flow of Sorted Demolition and Recycling: from placement of order to implementation

- Client
  - Violation of the law: fine or imprisonment

- Prefectural Governor
  - Advice, recommendation, order, collection of reports, on-the-spot inspection

Fig. II-28 Example of Recycling of Concrete Aggregate

- Source: Ministry of Land, Infrastructure and Transport

- Source: Committee for the Promotion of Recycling of Construction By-products (2004)
Legislation and Policies to Promote Creation of a 3R-Oriented Society

9 Food Recycling Law

(1) Title of the law: Law Concerning Promotion to Recover and Utilize Recyclable Food Resources (Food Recycling Law)
(2) Date put into force: May 2001 (promulgated in June 2000)
(3) Purpose: To prevent and reduce food waste discharged from food-related businesses, thereby decreasing the amount for final disposal, as well as to promote recycling of such waste as fertilizers and animal feeds.

Outline of the law
The law provides for measures to be taken by food-related businesses.

(1) Food waste to be regulated
(1) Unsold or uneaten food waste generated in the process of distribution and consumption
(2) Leftover plant and animal food generated in the process of manufacturing, processing and cooking food products (excluding kitchen waste discharged from households)

(2) Food-related businesses to be regulated
(1) Businesses engaged in the manufacture/processing of food products for wholesale or retail sales
(2) Restaurants and other food-service businesses
(3) Businesses that recycle food waste

(3) Responsibilities of food-related businesses
All food-related businesses engaged in manufacturing and distributing food products or providing restaurant services shall carry out recycling of food waste (through prevention of waste generation, and reduction of final disposal), and raise the recycling rate to 20% higher.

Fines shall be imposed on those discharging 100 tons or more of food waste annually in the case of not achieving this minimum 20% rate through the following order of process: advice, disclose and order.

(1) Prevention: preventing generation of food waste
(2) Recycling: using food waste as raw materials of fertilizer, animal feeds, oil and fat products or methane.

Fertilizers: compost made by aerobic fermentation, organic fertilizer made by drying
Animal feeds: feed for livestock or aquarium fish made by pressure steaming, aerobic fermentation or dehydration through frying
Oil and fat products: cooking oil, soap
Methane: biogas made by anaerobic fermentation of kitchen waste (composed of methane gas (about 60%) and carbon dioxide gas (about 40%)), used as fuel

(4) Responsibility of consumers
Consumers shall prevent generation of food waste by improving their methods of buying and cooking food and by using recycled products.

(5) Responsibility of the national and local governments
This law requires that businesses take measures to recycle intentionally.

The national and local governments shall implement recycling measures to promote recycling of recyclable food resources.

Penalties shall be imposed on those discharging 100 tons or more of food waste annually in the case of not achieving this minimum 20% rate through the following order of process: advice, disclose and order.

(1) Prevention: preventing generation of food waste
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Fertilizers: compost made by aerobic fermentation, organic fertilizer made by drying
Animal feeds: feed for livestock or aquarium fish made by pressure steaming, aerobic fermentation or dehydration through frying
Oil and fat products: cooking oil, soap
Methane: biogas made by anaerobic fermentation of kitchen waste (composed of methane gas (about 60%) and carbon dioxide gas (about 40%)), used as fuel

(3) Reduction: reducing the amount of food waste by dehydrogenation, drying, fermentation or carbonization (roasting)

(4) Responsibility of consumers
Consumers shall prevent generation of food waste by improving their methods of buying and cooking food and by using recycled products.

(5) Responsibility of the national and local governments
This law requires that businesses take measures to recycle intentionally.

The national and local governments shall implement recycling measures to promote recycling of recyclable food resources.

Table II-3 Amount of Food Waste Generated and Recycled (FY2004)

<table>
<thead>
<tr>
<th>Wasted generated (10,000 tons)</th>
<th>Reduction of generation (1)</th>
<th>Recycled (3)</th>
<th>Recycling rate (1)+(2)+(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fertilizer</td>
<td>Animal feeds</td>
<td>Methane</td>
</tr>
<tr>
<td>Food-Related businesses</td>
<td>(100)</td>
<td>(100)</td>
<td>(100)</td>
</tr>
<tr>
<td>Food manufacturers</td>
<td>490</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Food wholesalers</td>
<td>75</td>
<td>6%</td>
<td>2%</td>
</tr>
<tr>
<td>Food retailers</td>
<td>260</td>
<td>4%</td>
<td>1%</td>
</tr>
<tr>
<td>Food-service businesses</td>
<td>310</td>
<td>3%</td>
<td>2%</td>
</tr>
<tr>
<td>Total</td>
<td>1,136</td>
<td>4%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Note: The aggregate total may not correspond to the total amount because figures for individual amounts are rounded off.

10 Green Purchasing Law

Outline of the Law

The law provides that the national government, national organizations and local authorities shall take the lead in purchasing eco-friendly goods, while businesses shall choose eco-friendly goods when purchasing goods, to the greatest possible extent (see Fig. II-32).

Designated procurement items

The law designates the types of eco-friendly goods on which priority should be placed in procurement and judgment criteria with respect to 201 items (see Table II-4).

<table>
<thead>
<tr>
<th>Category</th>
<th>Designated procurement items</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper</td>
<td>8 items including information paper (copy paper, diazo-type paper), printing paper, hygienic paper toilet paper, facial tissue</td>
<td>Composition of recycled pulp, Degree of whiteness, etc.</td>
</tr>
<tr>
<td>Stationery</td>
<td>76 items including mechanical pencil, ball-point pens, scissors, dust blower, glue, files, binders, desk mats, windowed envelopes, blackboard dusters, can/bottle crushing machines</td>
<td>Use of recycled plastic, thinned wood, plant-origin plastic, global warming potential</td>
</tr>
<tr>
<td>Office Furniture</td>
<td>10 items including chairs, desks, shelves, coat hooks, umbrella stands, blackboards</td>
<td></td>
</tr>
<tr>
<td>OA Machines</td>
<td>10 items including copiers, printers, facsimile machines, display devices, digital printers</td>
<td></td>
</tr>
<tr>
<td>Home appliances</td>
<td>Refrigerators, freezers, refrigerators with freezer, electrically heated toilet seat</td>
<td></td>
</tr>
<tr>
<td>Air conditioners</td>
<td>Air conditioners, gas-heat pump systems, heaters</td>
<td></td>
</tr>
<tr>
<td>Water heaters</td>
<td>Electric hot water heaters, gas-water heaters, oil-fired water heaters, gas cookers</td>
<td></td>
</tr>
<tr>
<td>Lighting</td>
<td>Fluorescent lighting apparatuses, fluorescent light tubes</td>
<td></td>
</tr>
<tr>
<td>Vehicles</td>
<td>Automobiles, ETC devices, IC devices</td>
<td>Gas emissions, fuel consumption</td>
</tr>
<tr>
<td>Fire extinguishers</td>
<td>Fire extinguishers</td>
<td>Use of recycled extinguishing agent</td>
</tr>
<tr>
<td>Uniforms and Work clothes</td>
<td>Uniform, work clothes</td>
<td></td>
</tr>
<tr>
<td>Interior fixtures and bedding</td>
<td>Carpets, curtains, blankets, futons, bed frames, mattresses</td>
<td>Use of resin recycled from PET bottles</td>
</tr>
<tr>
<td>Work gloves</td>
<td>Work gloves</td>
<td></td>
</tr>
<tr>
<td>Other fixed goods</td>
<td>Tents, tarps, protective netting</td>
<td></td>
</tr>
<tr>
<td>Facilities</td>
<td>Photovoltaic generation systems, fuel batteries, solar thermal systems, kitchen waste disposers</td>
<td>Use of solar energy, Reduction of kitchen waste</td>
</tr>
<tr>
<td>Public works projects</td>
<td>Public works</td>
<td>Usage degree of recycled materials, emitted gas and noise</td>
</tr>
<tr>
<td>[1] Recycled materials (44 items including particle boards, ceramic-quality tiles, blast furnace cement, permeable concrete, heat-insulating window sashes/doors, automatic water taps, light control systems, and sewage sludge fertilizer)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[2] Construction machinery (low-emission type, low-noise type)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[3] Method of construction (6 items including recycling of concrete masses and road surface layer)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[4] Special purpose items (straining pavement, transparent paving and tree planting on the road)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services</td>
<td>Energy-saving diagnoses, cafeterias, printing, tire retread, car repair</td>
<td></td>
</tr>
<tr>
<td>Note: For green purchasing, environmental labels such as Eco-Mark (certified by the Japan Environment Association) and Eco-Leaf (used by the Japan Environmental Management Association for Industry) are important information sources to distinguish Eco-Friendly goods.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Table II-4 Designated Procurement Items and Criteria (201 in total)

Green procurement generally means that, when purchasing raw materials, manufacturers preferentially choose eco-friendly goods or procure products from manufacturers that implement environmental considerations. In other words, it means procuring materials and parts from manufacturers that have established systems for environmental management and prohibited substance management.

Large manufacturers have developed their own “green procurement criteria” and started taking measures accordingly. For example, 18 large information/communication device manufacturers unified their green procurement criteria in 2002 and included heavy metals and halogen compounds such as cadmium (Cd), lead (Pb), mercury (Hg) and hexavalent chromium (Cr6+) which are contained in materials and parts, as common items to be disclosed.

Furthermore, the EU will enforce the RoHS Directive (regulating specific toxic substances contained in electronic equipment imported into the EU) in July 2006 to prohibit home appliances and communication devices from containing Pb, Hg, Cd, and Cr6+ as well as two kinds of Br (bromine)-based flame retardants. Accordingly, some Japanese manufacturers have already started to implement green procurement in a stricter manner.
In the Guidelines for Waste Treatment and Recycling (by Product Category/Sector), the Industrial Structure Council indicates measures to be taken by businesses for waste treatment and recycling, with the aim of promoting voluntary actions. The Guidelines were first developed in 1990 with respect to 14 product categories and 10 sectors. After repeated revisions for improvement and enhancement of the contents, they were revised in October 2005 for the seventh time to regulate 35 product categories and 18 sectors in total. The Guidelines play two roles: [1] a collection of voluntary measures to be undertaken with respect to product categories and sectors that are not regulated under recycling-related laws, and [2] implementation guidelines with respect to product categories and sectors that are regulated under recycling-related laws. Industries aim at achieving the numerical targets for recycling set in the guidelines as quickly as possible.

Example of a guideline for waste treatment and recycling (Revised in October 2005)

**Pachinko machines, etc.**

- **Overview of the guideline**
  - Considerations to be taken into designing and manufacturing to 3R (1) Implementation of the product assessment
  - Disclosure of the conditions and effects due to the measures carried out
  - Reduce variety of materials and amount of lead
  - Standardized labeling of materials
  - Goals of material recycling
  - Measures for distribution and disposals
  - Acceptance of materials from other industries
  - Promotion of R&D
  - PR activity

### New collection system

- **Pachinko machines' distribution**
- **Collect at delivery**
- **Sort at a disposal site**
- **Recycled parts**
- **Manufacturers**
- **Recycling businesses**

### Measures for distribution and disposals

#### (1) Guidelines by product category (35 commodities)

- **Paper**
- **Plastics**
- **Bicycles**
- **Carpets**
- **Lead batteries for automobiles and two-wheel vehicles**
- **Fire extinguishers**
- **Gas and kerosene equipment**
- **Construction materials**
- **Fluorescent tubes**

#### (2) Guidelines by sector (18 businesses)

- **Iron and steel**
- **Textiles**
- **Car part manufacturing**
- **Leasing**
- **Gas**

### Progress of measures implemented (overview)

1. Considerations to be taken into designing and manufacturing toward 3R
2. Implementation of research on types of resin and amount of environmental burden (e.g., lead) used
3. Material labeling for resin parts which weigh 100g and more. For the parts less than 100g, labeling is extended to a maximum extent
4. Material recycling
5. PR activity

### Progress of measures implemented (Development of recycling iron and steel slag)

- Amount of iron and steel slag generated: 38.74 million tons in FY2004 (33.80 million tons in FY2002)
- Final disposal of iron and steel slag: 55.000,000 tons in FY2004 (70.000,000 tons in FY2001)
- Effective use of iron and steel slag: 58.93% in FY2004 (69.07% in FY2002)
- Measures to further increase utilization
  - Further increased recycling of iron and steel slag and started R&D to strengthen fishing environment by repairing environment and improving ocean current
  - Designated procurement item for Green Purchasing Law (electric furnace of iron and steel slag)
- Enrichment
  - Efforts have been made to enrich the content of the web site with the purpose of dissemination of iron and steel slag products. A new web site for beginners is completed.

### Revision of the guideline

#### Setting numerical goals for recycling

- A goal for material recycling is set as 75% in FY2007.

### Iron ore industry

- **Overview of the guideline**
  - Goal to reduce final disposal
  - Meets a goal of a 35% decrease in final disposal in FY2010 in comparison with FY1998
  - Recycling of iron and steel slag
  - Acceptance of materials from other industries
  - With regard to waste plastic (including waste plastic, waste tires, ASR, shredder dust and the law to prevent irregularity

### Progress of measures implemented (Development of recycling iron and steel slag)

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- Enrichment
  - Efforts have been made to enrich the content of the web site with the purpose of dissemination of iron and steel slag products. A new web site for beginners is completed.

### Revision of the guideline

- Goal to reduce final disposal
  - Continuously strive for achieving the goal of a 35% decrease in final disposal in FY2010 in comparison with FY1998
  - Recycling of iron and steel slag
  - Acceptance of materials from other industries
  - With regard to the acceptance of waste plastic, make an effort to achieve a goal of accepting one million tons in 2010 given that conditions including a system of goods collection area are met.
Guideline for governance of waste and recycling is a concept of an ideal approach for a corporation (discharger) to increase the corporate value through improvement of corporate brand image and reduced management risk by preventing an inappropriate discharge of waste by the corporation. The guideline has three specific points to consider. Necessity of a company-wide approach, where not only the personnel in charge of waste management on site but also entire organization from the top management to employees are involved in disposal and recycling of waste, is presented as a primary point. The importance to promote appropriate disposal, among others, through active involvement of top management by securing personnel and budget for the waste control department and requiring a company-wide approach, is emphasized. Secondary, in order to mitigate the risk of inappropriate discharge of the waste by the corporation, the significance of establishing a cooperative relationship with broader varieties of parties concerned including subsidiaries, partner corporations, retailers, disposal and recycling businesses to pursue appropriate treatment of the waste is highlighted. Coordination with disposal and recycling businesses has greater significance because it will enable the discharger to properly carry out disposal and recycling through opinion exchange about better methods of sorting, treatment and recycling of waste.

The third point to consider is the idea of provision and sharing information with a variety of third parties such as customers, consumers, investors including stockholders of the corporation, local community including local communities about approach made by the corporation. This effort allows the corporation to receive reasonable assessment over the approach made by them which help them further improve governance of waste and recycling.

Fig. II-34 Flow followed by a discharger to practice the governance of waste and recycling

2. Points to be considered in governance of waste and recycling

Governing waste and recycling is a concept of an ideal approach for a corporation (discharger) to increase the corporate value through improvement of corporate brand image and reduced management risk by preventing an inappropriate discharge of waste by the corporation. The guideline has three specific points to consider.

Necessity of a company-wide approach, where not only the personnel in charge of waste management on site but also entire organization from the top management to employees are involved in disposal and recycling of waste, is presented as a primary point. The importance to promote appropriate disposal, among others, through active involvement of top management by securing personnel and budget for the waste control department and requiring a company-wide approach, is emphasized.

Secondary, in order to mitigate the risk of inappropriate discharge of the waste by the corporation, the significance of establishing a cooperative relationship with broader varieties of parties concerned including subsidiaries, partner corporations, retailers, disposal and recycling businesses to pursue appropriate treatment of the waste is highlighted. Coordination with disposal and recycling businesses has greater significance because it will enable the discharger to properly carry out disposal and recycling through opinion exchange about better methods of sorting, treatment and recycling of waste.

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Environmental Labels and Identification Marks

"Environmental Labels and Declarations" is a claim representing environmental aspects of the product and service of which general principles are provided by ISO14020. "Environmental labels and declarations - General principles", a standard issued by International Organization for Standardization (and JIS (Japan Industrial Standard) Q 14020) as a stimulator to promote supply and demand of eco-friendly products and services and possibility of continuous market-oriented improvement of the environment. It can be presented in the form of statements, symbols or graphics made on product or packaging labels, product literature, technical bulletins, advertising, publicity or similar applications.

JIS categorizes the environmental labels into three types based on the ISO standard.

1. **Type I: Environmental labels**
   - The type I Environmental label is a label granted by third-party bodies operated in accordance with ISO 14024 (Environmental labels and declarations - Type I environmental labeling - Principles and procedures) issued in 1999 and JIS Q 14024 established in 2000. In this system, third-party accreditation bodies establish criteria among the environmental friendliness of products in comparison with other similar products in light of the entire life cycle for specific kinds of commodities, and certify some products as environmentally friendly in accordance with the criteria. Predetermined marks can be attached to certified products.
   - “Eco-Mark” in Japan, “Blue Angel” in Germany and “Nordic Swan” in North European countries are included in Type I labels.
   - “Eco-Mark” service is provided by the Japan Environment Association (http://www.jear.or.jp) which started its service in 1989 with 7 product items of “spray products in which the designated CFC is not used”. They cover 42 product categories and 5,000 brands as of January 2005 as a result of annual extension of subject product categories and certified products. “Eco-Mark” service is provided by the Japan Environment Association (http://www.jear.or.jp) which started its service in 1989 with 7 product items of “spray products in which the designated CFC is not used”. They cover 42 product categories and 5,000 brands as of January 2005 as a result of annual extension of subject product categories and certified products.

2. **Type II environmental labels**
   - The type II Environmental labels is a type in which self-declaration is made by businesses in accordance with ISO 14021 (Environmental labels and declarations - Self-declared environmental claims - Type II environmental labeling) issued in 1999 and JIS Q 14021 established in 2000. Since assuring reliability is essential in self-declared environmental claims and vague or unclear environmental claim would mislead consumers, definition is provided to the following twelve terms.

   - Compostable
   - Degradable
   - Designed for disassembly
   - Extended life product
   - Recovered energy
   - Recycled content
   - Preconsumer materials, postconsumer materials, recycled material, collected (recyclad) materials
   - Reduced energy consumption
   - Reduced resource use
   - Reduced water consumption
   - Reusable and refillable
   - Waste reduction

   The type II label is based on self-declarations by businesses of their environmental consideration, indicating how environmentally friendly their products are, in the form of statements, symbols or graphics. Additionally, “Mobius Loop” is a symbol claiming “Recyclable” or “Recycled Content.”

3. **Type III environmental labels**
   - The type III environmental label indicates qualitative data on the environmental impact of products through the entire life cycle, from gathering of resources to manufacturing, use, and disposal/recycling, calculated by the life cycle assessment (LCA) method and using predetermined environmental indicators in accordance with ISO/TR 14025; indication of qualitative environmental data, a technical report issued in March 2004. Although only a few countries adopt the type III environmental labels, preparations toward effectivation of the ISO standard as of December 2006 is in progress.

   ![Fig. II-38 Eco-Leaf](Image)

   - Assessment of overall recycling process

   Industrial associations and companies also use their own original identification marks to indicate recycled products and materials to be selectively collected.

   ![Fig. II-37 Identification Marks](Image)

   (Source: Japan Environmental Management Association for Industry)
(1) Toward realization of green product chain
In reducing environmental burden and minimizing material consumption and amount of waste generated through the entire life cycle of the product (from material acquisition and utilization to recycling and disposal of end-of-life product), it is essential to take the concept of the 3Rs into the designing and manufacturing, design for environment (DfE).

Although the idea of energy saving in the light of global warming should be incorporated into DfE in addition to the design and manufacturing requiring efficient material consumption, controlling waste amount, detoxification and an easy disassembly, bear in mind that the nature of those design aspects may conflict with each other.

By adopting DfE, a positive effect leading a variety of industries to promote development of eco-friendly products seems to be spreading. Effective material usage through cyclical use by utilizing recycled material made from used products in the same product category increases at some manufacturers.

Accelerating to expand a sound material-cycle society economic society demands materialization of “green product chain” in which environmental considerations are incorporated through “green manufacturing” by manufacturers and it will be assessed by green consumers and green markets.

Use of a range of information about environmental considerations taken into the product is essential to realize it. For efficient use of such information by each party concerned, visualization and communication of each stage of the product life cycle (i.e., material procurement, production, distribution/retailing, consumption/purchase, discharge/taking back and reusing/recycling) is needed. Such information in addition to the traditional information about functions and price will become new evaluation criteria at the market resulting in bearing vital power to further stimulate the businesses who are properly evaluated and enabling them to produce more innovation.

Considering the current development of global trend of accelerated division of labor and market globalization, satisfying DfE based on the global point of view is critical. ISO as international standards, therefore, provide Guide 64 (Guide for the inclusion of environmental aspects in product standards) and TR14062 (Environmental management - pre-evaluation under their own guidelines).

Product assessment (pre-evaluation) means that manufacturers, prior to production, investigate, estimate and evaluate the safety and resource/environmental impact of their products in the stages of production, distribution, use, discharge, and recycling/disposal, and amend their product designs and production methods as necessary, thereby reducing the resource/environmental impact.

(2) Provision of product information
In order to integrate DfE into the economic system and benefit the entire company, clear standardization in labeling and assessment indices for DfE facilitating each entity involved in the product life cycle is vital.

Law for Promotion of Effective Utilization of Resources therefore designates product items in which the 3Rs are considered. Items include; automobiles, home electric appliances (television sets, refrigerators, washing machines, microwave ovens, clothes driers), PCs, copiers, metal furniture, gas/oil equipment, bathroom units, pachinko machines. Items required labeling for separate collection include; PET bottles, steel cans, aluminum cans, plastic tray packaging, paper container packaging and compact secondary batteries. Moreover, a new information disclosure system with information of materials contained in the product is planned to be introduced in July 2006.

Fig. II-39 Identification of materials contained

Subject materials contained (labeling is obligatory)
Subject materials not contained (labeling is optional)

*Notes: The symbol presented in left side shall be attached to the body and packaging of the subject product items (PCs, air conditioners, television sets, refrigerators, washing machines, microwave ovens, clothes driers) containing subject materials (lead and lead compounds, mercury and mercury compounds, hexavalent chromium compounds, cadmium and cadmium compounds, polybromino-diphenyls, polybromino-diphenyl ether).

Integrating environmental aspects into product). IEC, International Electrotechnical Commission started to study environmental standards covering a variety of products seeking for international alignment at the WG2 of a new technical committee (TC111).

(3) Product assessment guidelines applied by industrial associations
In 1994, the Industrial Structure Council established the "Guidelines for Preparing Pre-Evaluation Manuals in Product Designing to Contribute to the Promotion of the Use of Recycled Resources" as a reference for manufacturers to achieve DfE.

Industrial associations developed "product assessment guidelines" applicable to their products in accordance with the Council Guidelines. They implement DfE by conducting assessment guidelines applicable to their products in accordance with the Council Guidelines. They implement DfE by conducting Table II-5 Establishment/Revision of Product Assessment Guidelines of Industrial Associations

<table>
<thead>
<tr>
<th>Name of association</th>
<th>Condition of product assessment guidelines</th>
<th>Name of association</th>
<th>Condition of product assessment guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>(<a href="http://www.jama.or.jp">http://www.jama.or.jp</a>)</td>
<td>Guidelines for Pre-Evaluation in the Product Designing Stage for Promotion of Recycling established</td>
<td>(<a href="http://www.jason.or.jp">http://www.jason.or.jp</a>)</td>
<td>Product Assessment Manual: Luminaires revised (to include 3R programs)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Japan Electric Machine Association</td>
<td>Product Assessment Manual established</td>
</tr>
<tr>
<td></td>
<td></td>
<td>July 2000</td>
<td>Product Assessment Manual revised (to include 3R programs)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Japan Bicycle Promotion Institute</td>
<td>Product Assessment Manual revised (to include 3R programs)</td>
</tr>
<tr>
<td>(<a href="http://www.ibpi.or.jp">http://www.ibpi.or.jp</a>)</td>
<td>March 2002</td>
<td>Product Assessment Manual (including 3R programs)</td>
<td>Product Assessment Manual revised (to include 3R programs)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Electric Home Appliances revised (to include 3R programs)</td>
<td>Product Assessment Manual revised (to include 3R programs)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Environmental Designing</td>
<td>Product Assessment Manual revised (including 3R programs)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assessment Guidelines</td>
<td>Product Assessment Manual revised (to include 3R programs)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>for Information Processing Devices</td>
<td>Product Assessment Manual revised (including 3R programs)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Environmental Designing</td>
<td>Assessment Guidelines for Information Processing Devices revised (to include 3R programs)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assessment Guidelines</td>
<td>Assessment Guidelines for Information Processing Devices revised (to include 3R programs)</td>
</tr>
<tr>
<td>(<a href="http://www.joifa.or.jp">http://www.joifa.or.jp</a>)</td>
<td>Guidelines on Environmental Measurement for Office Furniture revised (to include 3R programs)</td>
<td>(<a href="http://www.jiaa.or.jp">http://www.jiaa.or.jp</a>)</td>
<td>Assessment Guidelines for Gas/Kerosene Appliances revised (to include 3R programs)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Japan Gas Association</td>
<td>Assessment Guidelines for Gas/Kerosene Appliances revised (to include 3R programs)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(<a href="http://www.jgas.or.jp">http://www.jgas.or.jp</a>)</td>
<td>Assessment Guidelines for Gas/Kerosene Appliances revised (to include 3R programs)</td>
</tr>
</tbody>
</table>
Legislation and Policies to Promote Creation of a 3R-Oriented Society

15 Global materials recycling

Exporting recycled material from Japan to Asia grows rapidly and there is an increasing demand for proper waste disposal management of Japanese businesses having local offices overseas. Under these circumstances, in order to achieve accurate control of the material used in the area together with economic growth in Asia, a significant goal for more efficient material use by attaining a more recycling-oriented economic structure, technological innovation and its dissemination is established. Environmental pollution under the name of promotion of 3Rs shall never be permitted. From this viewpoint, environmental pollution should be avoided, proactive measures are necessary to respond to worsened problems of waste disposal thereby preventing the pollution caused by improper treatment/recycling of wastes.

![Fig. II-42 Sustainable material-cycle economic society in Asia](image)

Source: Industrial Structure Council, October 15, 2005

Exporting recycled material from Japan to Asia grows rapidly and there is an increasing demand for proper waste disposal management of Japanese businesses having local offices overseas. Under these circumstances, in order to achieve accurate control of the material used in the area together with economic growth in Asia, a significant goal for more efficient material use by attaining a more recycling-oriented economic structure, technological innovation and its dissemination is established. Environmental pollution under the name of promotion of 3Rs shall never be permitted. From this viewpoint, environmental pollution should be avoided, proactive measures are necessary to respond to worsened problems of waste disposal thereby preventing the pollution caused by improper treatment/recycling of wastes.
### Glass Bottles

Glass bottles are recycled in two ways: by repeatedly using returnable bottles such as beer bottles, large-size bottles, and milk bottles, and by collecting one-way bottles, such as food/seasining bottles, drink bottles, medicine/vitamin drink bottles, and reusing them as raw materials for glass bottles (cullets) (see Fig. III-2).

The cullet use rate has been increasing every year since FY1989 and had already reached 90.7% by FY2004, exceeding the 85%-level that was expected to be achieved by FY2005 under the Law for Promotion of Effective Utilization of Resources (see Fig. III-1). The amount of glass bottles selectively collected and recycled under the Containers and Packaging Recycling Law was 770,000 tons (FY2004).

### Steel Cans

The weight of steel cans recycled in 2004 was about 790,000 tons and the recycling rate was 87.1%, exceeding the 85% level targeted in the Guidelines for Waste Treatment and Recycling by Product Category (see Fig. III-4). Thus, recycling of steel cans is going smoothly, for the following reasons.

1. **Further dissemination of separate collection (system itself) at each municipality**
2. **Steel selection is easily done with magnetized selector**
3. **More facilities to recycle steel (74 iron mills are available nationwide)**

The number of drink cans consumed in 2004 was 31.1 billion, of which 41.0% were steel cans. Steel cans are pressed into scraps and used as materials for electric and steel furnaces in iron-making plants. They are also used as materials for automobiles, home appliances, railroads, and ships as well as construction materials for buildings and bridges (see Fig. III-5).


### Aluminum Cans

The weight of aluminum cans consumed, the weight of cans recycled and the recycling rate have been increasing year by year (see Fig. III-6) as the rate of canned beer and the rate of aluminum cans for drinks other than beer have been increasing. About 59% of the amount of drink cans consumed in 2004 were aluminum cans. The recycling rate of aluminum cans has been improving due to:

1. the spread of sorted collection,
2. the large number of users of recycled cans, and
3. the ease of recycling aluminum cans.

In FY2004, the amount of aluminum cans recycled was 261,000 tons and the recycling rate was 86.1%, with businesses being asked for their continuous cooperation and to conduct educational activities in order to achieve the 85% level set for by 2006 under the Guidelines for Waste Treatment and Recycling by Product Category. The weight of aluminum cans reused as materials was 161,000 tons in 2004 and the can-to-can rate was 61.7%. Aluminum cans are also reused for automobile engine blocks, motor housings, deoxidizers for iron-making and materials for pots and frying pans (see Fig. III-6 and III-7).

### PET Bottles

PET bottles used for soft drinks, soy sauce and alcohol are to be labeled under the Law for Promotion of Effective Utilization of Resources (see page 18). The majority, 95%, of such PET bottles is used for soft drinks, 2% for soy sauce and 2% for alcohol. Some 36,000 tons of PET bottles were also produced for seasonings, cosmetics, and detergents in (2004).

As for PET bottles that have been labeled since the Containers and Packaging Recycling Law was put into force in 1997, the amount of PET bottles produced, the amount of bottles separately collected and the collection rate have been increasing rapidly, as the amount of PET bottles produced for soft drinks increases and the number of municipalities carrying out sorted collection of PET bottles under the Containers and Packaging Recycling Law increases significantly (see Fig. III-8).

The collection rate of PET bottles is 62.3% in FY 2004 if the 81,000 tons recycled from businesses, which has been confirmed by the Council for PET Bottle Recycling, is added.

Through sorted collection of PET bottles, carried out by municipalities via the designated body under the Containers and Packaging Recycling Law (Japan Containers and Packaging Recycling Association: see Fig. II-11), about 148,000 tons of resin was recycled (in FY2004), of which about 43% was used for carpets and other textile products, and about 43% as sheets for egg cartons (see Fig. III-9 and III-10). Retailers also recovered PET bottles independently (see Fig. II-10).

Bottle-to-bottle recycling by chemical decomposition was actualized by 2003. The aim of this technology is to decompone used PET bottles into materials for PET resin such as monomers (dimethyl terephthalate or bis(hydroxyethyl) terephthalate), and polymerize these materials again to make PET resin for PET bottles.
Some important points with respect to recycling of plastic waste are as follows.

1. The effective use rate reached 60%.
2. Reuse of general waste plastic and amount of waste plastic recycled to produce RDF is significantly increasing.
3. Export of plastic scraps is increasing.

The amount of plastic waste generated in 2004 was 5.19 million tons as MSW and 4.94 million tons as industrial waste. Of the 6.11 million tons of plastic waste used effectively, 1.81 million tons were used as raw materials (material recycling), 300,000 tons were used for liquefaction, gasification or blast furnacing (chemical recycling), the majority of both (2.11 million tons), 550,000 tons were used as refuse-derived fuel (RDF), including raw material/Fuel for cement (thermal recycling); 2.15 million tons were incinerated for power generation from waste (thermal recycling), and 1.29 million tons were incinerated for heat, application (thermal recycling). (See Fig. III-12) Of the 1.81 million tons used as plastic materials, 900,000 tons were contained in finished products (the remaining 910,000 tons were production/waste), the majority of which was used in PET bottles (387,000 tons), followed by packaging film (103,000 tons) and agricultural use (75,000 tons) and polyethylene foam including trays (72,000 tons). Meanwhile, the amount of plastic scraps exported in 2004 was 680,000 tons, up 130,000 tons from the previous year, which indicates that the international recycling system is being established, with China taking a leading role.

Active movements toward waste reduction and reuse can also be seen in the plastic industry. Resin manufacturers and processing businesses are making concerted efforts for technological development, such as thinning PET bottles and shopping bags and unifying the grades for materials of car bumpers.

### 5 Plastics

Styrofoam in a broad sense is divided into three types, according to the manufacturing method: expanded polystyrene (EPS) or styrofoam in a narrow sense; polystyrene paper (PSP); and extruded polystyrene (XPS). These three types of styrofoam are used and treated in final disposal differently.

1. **EPS:** It is used for containers for agricultural or fishery products or buffer packaging for home appliances and OA equipment, and generally discharged from businesses. The amount of EPS supply decreased slightly from about 240,000 tons in 1991 to about 200,000 tons in 2002. The amount of domestic distribution has been about 170,000 to 180,000 tons (see Fig. III-14), of which 58% is used for containers for fresh fish or vegetables/fruits, 27% for buffering, and the rest for construction/civil engineering (see Fig. III-13).

EPS waste is collected through wholesale markets, and large home appliance stores and supermarkets or by businesses engaging in intermediary treatment of industrial waste. The amount of EPS collected and recycled has been increasing year by year, reaching 71,800 tons (material recycling) with the material recycling rate at 41%. In 2004. Collected EPS waste is recycled as ingots (about 80%) is exported, reused as packaging, videocassettes or synthetic wood after being palletized, or used as mortar additives after crushing. Thermal recycling such as incineration for power generation was carried out for 28.3% of domestic distribution (2004). Chemical recycling, such as reduction in blast furnacing, liquefaction or gasification, also started in 2001 (see Fig. III-14).

### 6 Styrofoam

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### Fig. III-13 Amount of EPS Supplied, by use (thousand tons/year)

<table>
<thead>
<tr>
<th>Year (tons/year)</th>
<th>Domestic distribution</th>
<th>Others</th>
<th>Crushed</th>
<th>Others</th>
<th>Total</th>
<th>Crushed</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>1,200</td>
<td>2,000</td>
<td>3,200</td>
<td>6,400</td>
<td>8,600</td>
<td>6,400</td>
<td>2,000</td>
</tr>
<tr>
<td>1993</td>
<td>1,400</td>
<td>2,200</td>
<td>3,600</td>
<td>7,200</td>
<td>9,800</td>
<td>7,200</td>
<td>2,200</td>
</tr>
<tr>
<td>1994</td>
<td>1,600</td>
<td>2,400</td>
<td>3,800</td>
<td>9,000</td>
<td>10,400</td>
<td>9,000</td>
<td>2,400</td>
</tr>
<tr>
<td>1995</td>
<td>1,800</td>
<td>2,600</td>
<td>4,000</td>
<td>10,600</td>
<td>12,200</td>
<td>10,600</td>
<td>2,600</td>
</tr>
<tr>
<td>1996</td>
<td>2,000</td>
<td>2,800</td>
<td>4,200</td>
<td>12,200</td>
<td>15,000</td>
<td>12,200</td>
<td>2,800</td>
</tr>
</tbody>
</table>

Note: Material recycling rate = Amount recycled / Amount supplied

Source: Japan Expanded Polystyrene Recycling Association
Since the Industrial Structure Council formulated the Action Plan for Promotion of Paper Recycling in January 2001, the parties concerned have been promoting paper recycling.

Outline of the Action Plan for Promotion of Paper Recycling

- Paper-manufacturing businesses shall promote paper recycling with the aim of achieving the self-imposed goal to increase the paper-recycling rate to 60% by FY2005.
- Paper-using businesses shall collect and provide information necessary to develop easily recyclable products and to promote the use of recycled paper.
- The Paper Recycling Promotion Center shall increase awareness and provide information concerning paper recycling among consumers, businesses, and local governments.
- The national government and the Paper Recycling Promotion Center shall promote recycling of paper-containing packaging and use of recycled paper for other products.

In 2004, the production of paper/paperboard reached 30.89 million tons, the majority of which is consumed domestically (see Fig. III-15).

Used paper discharged from households is collected by citizens or at collection spots or places of exchange for toilet paper. Used paper discharged from industries is collected by tsuboage businesses (engaged in collecting mainly industrial paper) and local governments.

In 2004, 21.51 million tons of used paper was collected and about 18.54 million tons of recycled paper was consumed (see Fig. III-16). Both the paper collection rate and the paper recycling rate (rate of used paper to the total paper-making raw materials) have been increasing year by year, reaching 68.5% and 60.4% in 2004 respectively (see Fig. III-17).

Under the Containers and Packaging Recycling Law, 69.197 tons of used paper containers were separately collected by municipalities (see Fig. III-11) and 59.668 tons were recycled in 2004 (Source: Ministry of Environment, http://www.env.go.jp).

Recycled paper is used for many kinds of products such as toilet paper and telephone books. About 80% of the total amount of recycled paper is used for corrugated cases, newspapers, and magazines. Slightly less than 1% of the total recycled paper is also used as trays for eggs or vegetables/fruit and insulating construction materials.

In May 1997, the Ministry of International Trade and Industry (the current Ministry of Economy, Trade and Industry) published the End-of-Life Vehicle Recycling Initiative, which set specific numerical targets such as improving the recycling rate for end-of-life vehicles to 95% or over by 2025 and reducing the amount of end-of-life vehicles dumped into landfill to 1/5 of the amount in 1996.

Shredder dust generated from end-of-life vehicles (waste remaining after shredding dismantled ELVs) was mainly used as landfill. But the shortage of final waste disposal facilities means we need to decrease the quantity of shredder dust used as landfill. Furthermore, fees are needed when car owners dispose of cars because of the rising landfill fee and changes in the fee for iron scraps. Under these circumstances, the recycling system of ELVs was in disarray at one time, and there was concern about illegal disposal.

It contributes to global warming when car air conditioners and CFCs are not treated properly. Airbags are an obstacle in car dismantling and need professional treatment. In view of these circumstances, the End-of-Life Vehicle Recycling Law is enacted as of January 2005. As the Law for Promotion of Effective Utilization of Resources includes automobiles in the specified resource-saving products and the specified reuse-promoting products, the automobile industry works on the recycling of resin parts, development of recycling technology in consideration of the discarding stage, development of new materials and car structures that will contribute to recycling, and implementation of material marking.

In 2004, the number of disused vehicles owned was 74.66 million while the number of disused vehicles has remained almost unchanged in the past decade at around 4 million a year (see Fig. III-18). The recycling system for end-of-life vehicles has already been established in the form of infrastructure for collecting iron scraps.

In this system, the collection rate is nearly 100% and the recycling rate has reached 80% (see Fig. III-19). In May 1997, the Ministry of International Trade and Industry (the current Ministry of Economy, Trade and Industry) published the End-of-Life Vehicle Recycling Initiative, which set specific numerical targets such as improving the recycling rate for end-of-life vehicles to 95% or over by 2025 and reducing the amount of end-of-life vehicles dumped into landfill to 1/5 of the amount in 1996.

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Motorcycle manufacturers that are members of Japan Automobile Manufacturers Association and participating motorcycle importers established a voluntary motorcycle recycling system in October 2004.

System of motorcycle recycling

There are 190 (designated) collecting sites for disused motorcycles in Japan. Businesses dealing with the disused motorcycles recycling system (15,000 shops) are clearly identified with the sticker so that users can readily recognize. For disposal/recycling of disused motorcycles, 14 facilities are properly established nationwide. Proper treatment is provided to the motorcycles in accordance with the instruction manual developed by participating manufacturers and importers. Since recycling fee is paid at the time of purchase when buying a new motorcycle bearing a recycling label, motorcycle shops take the motorcycle without charging a user with the fee when it is disused. For motorcycles without recycling label, users pay the fee for recycling.

An electronic information system is introduced by the designated body to collect the motorcycle, disposal/recycling facilities and management company for more efficient management of recycling fees, information and distribution of motorcycles. Traditional manifest is replaced by the control voucher (recycling fee receipt integrated) to manage the distribution until it is taken for recycling.

Recycling data

The number of motorcycles bearing a recycling label brought into market is 178 in total as of the end of March 2005 accounting for 28% of the total of motorcycles shipped by participating businesses within Japan. The number of disused motorcycles taken back by the designated bodies is 1,456 by September 2005. The disposed portion categorized as general waste is 66% while 34% is categorized as industrial waste.

Recycling rate of scooters is 84.5% whereas the rate of motorcycles is 86.7%.

25 million vehicle batteries for new vehicles or maintenance are brought into Japanese market annually. The life of vehicle batteries is roughly 3-5 years depending on usage.

Due to the nature of vehicle batteries, plastic such as polypropylene and large amount of lead and sulfuric acid is contained in it so that a proper disposal, therefore, is vital.

The current recycling system of vehicle batteries is established. The members of the Battery Association of Japan that are battery manufacturers voluntarily purchase recycled lead batteries and take back and recycle them and 20 million lead batteries are expected taken back annually.

Although this system exerted some effectiveness and functionality, there was a concern that collection of batteries became stagnant due to increased amount of imported vehicle batteries of which recycling requirements were not necessarily met and possibility that disused batteries would become chargeable if the market price of lead had significantly dropped. In view of these circumstances, the reports are collected and sorted at the joint meeting of the Central Environment Council in order to assure the effectiveness of collection and recycling of imported batteries and establish a continuous and stable system which is less susceptible to the trend of the lead market.
There are many types of batteries/cells, as shown in Fig. III-25.

Among these types of batteries/cells, the Law for Promotion of Effective Utilization of Resources stipulates that compact rechargeable batteries (nickel-cadmium batteries, nickel metal hydride batteries, lithium ion batteries, and compact sealed lead batteries) shall be collected and recycled by manufacturers of compact rechargeable batteries, and collected by manufacturers of equipment that uses such batteries (29 items; see page 18). Collection and recycling of compact rechargeable battery is carried out by the Japan Portable Rechargeable Battery Recycling Center (JBBC), which consists of manufacturers of compact rechargeable batteries and manufacturers of equipment that uses such batteries and Mobile Recycling Network which consists of Telecommunications Carriers Association and Communications and Information Network Association of Japan. Compact rechargeable batteries are collected from cooperative shops such as electric appliance home improvement retailers and bicycle shops, and registered businesses engaging in electric works and building maintenance, municipalities, and schools, and mobile phone retailers, and then converted by recycling contractors into nickel, cadmium, cobalt, lead, and iron. The amount of compact rechargeable batteries collected has been increasing year by year, and in FY2004, 5,278 tons in total of such batteries were collected (see Fig. III-1). The recycling rate differs among types of compact rechargeable batteries, ranging from 50% to 77% (FY2004).

Rechargeable Battery Recycling Club. You can search for these collection spots on the JBRC Website (http://www.jbrc.com).

### Table III-1 Amount of Compact Secondary Batteries (Rechargeable Batteries) Collected

<table>
<thead>
<tr>
<th>Type</th>
<th>Voluntary collection (t)</th>
<th>Disposal (t)</th>
<th>Recycled (t)</th>
<th>Recycling rate (%)</th>
<th>Statutory targets (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel-cadmium batteries</td>
<td>975</td>
<td>287</td>
<td>797</td>
<td>25</td>
<td>-</td>
</tr>
<tr>
<td>Nickel metal hydride batteries</td>
<td>310</td>
<td>92</td>
<td>218</td>
<td>69</td>
<td>50</td>
</tr>
<tr>
<td>Lithium iron batteries</td>
<td>235</td>
<td>211</td>
<td>24</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>Compact sealed lead batteries</td>
<td>3,694</td>
<td>1,062</td>
<td>2,632</td>
<td>76</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td>5,278</td>
<td>5,199</td>
<td>5,831</td>
<td>75</td>
<td>80</td>
</tr>
</tbody>
</table>

Notes: This data figure is actual data of FY2004 while figure in parenthesis indicate a sum of FY2001 based on the data reported by JBBC, Battery Recycling Club, Telecommunications Carriers Association and Communications and Information Network Association of Japan (Mobile Recycling Network).

### Table III-2 Factual data of recycling of cell-phones

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand total</td>
<td>13,615</td>
<td>13,107</td>
<td>11,369</td>
<td>11,717</td>
<td>8,528</td>
</tr>
<tr>
<td>Weight collected (t)</td>
<td>819</td>
<td>799</td>
<td>746</td>
<td>821</td>
<td>677</td>
</tr>
<tr>
<td>Amount recycled (t)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recycling rate (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amount collected (t)</td>
<td>3,128</td>
<td>3,355</td>
<td>3,845</td>
<td>4,387</td>
<td>3,181</td>
</tr>
<tr>
<td>Weight collected (t)</td>
<td>328</td>
<td>361</td>
<td>351</td>
<td>319</td>
<td>284</td>
</tr>
<tr>
<td>Amount recycled (t)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recycling rate (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Battery</td>
<td>11,847</td>
<td>11,788</td>
<td>9,727</td>
<td>10,247</td>
<td>7,312</td>
</tr>
<tr>
<td>Weight collected (t)</td>
<td>304</td>
<td>284</td>
<td>193</td>
<td>153</td>
<td>169</td>
</tr>
<tr>
<td>Amount recycled (t)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recycling rate (%)</td>
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Notes: Collection rate is calculated at the time of new purchase and cancellation of the contract using the following formula.

Amount recycled = recycling rate × weight collected

The number of subscribers of cell-phones in Japan exceeds 90 million as of the end of March 2005 resulting in a 70% dissemination rate against population. Many subscribers tend to purchase latest models within a short time of period (2 to 2.5 years) and many cell-phones are disposed.

Cell-phones use rare metals such as gold, silver and palladium as well as general metals of copper, aluminum or iron. On top of it, some parts contain toxic material, e.g., GaAs which requires extra-careful treatment since it will be environmental burden if disposed as non-burnable waste. The Law for Promotion of Effective Utilization of Resources obliges collection and recycling of batteries (compact secondary batteries).

Recycling of cell-phones is promoted by Mobile Recycling Network which consists of cell-phone manufacturers and telecommunication carriers. Body of cell-phones, rechargeable batteries and batteries are voluntarily collected at distributors at no cost and are recycled as metal materials.

Environmental Impact Assessment for cellular phones and PHSO is established as a guideline for the manufacturers and assessments are implemented.
Personal Computers

In accordance with the Law for Promotion of Effective Utilization of Resources enacted in April 2001, computer manufacturers have been required to design products that consider the 3Rs (reduce, reuse, and recycle), and are also obliged to collect and recycle disused computers for business use. Manufacturers have also been required to collect and recycle computers discharged from households. Accordingly, computers sold on or after October 1, 2003, and discharged from households in principle, to be collected at designated collection spots, free of charge, and recycled. Computers subject to collection are; desktop PCs including body, CRT display and LCD, and laptop PCs. Standard peripheral devices such as keyboards and mouse are collected if they are discharged with PCs.

Unlike large-sized home electric appliances, disused PCs of home-use is not necessarily leave the end-user when a new PC is bought due to its distribution system feature, since purchasers take the product home and transferring data from the old PC is common. A different system from large-sized home electric appliances is established for PCs.

At present, collection system is established by cooperation between Japan Portable Rechargeable Battery Recycling Center (JBRRC) and Japan Post designating post offices as collection spot of disused PCs from households so that the PCs are collected through "Eco Yu Pack", parcel service for disused PC collection. The number of computers collected from households reached a total of 227,000 in 2004.

October is a month for promoting 3Rs

"The month for promoting 3Rs" was originally "the month for promoting recycling" in the light 1R in the Law for the Promotion of Utilization of Recycled Resources enacted in October 1991. Subsequently, more comprehensive approach is demanded through 3Rs (Reduce of wastes, Reuse and Recycling), not only 1R, in order to overcome the constraint of environment and material and keep sustainable development. Basic ideas of 3Rs is defined by the Basic Law for Establishing the Recycling-based Society and specific approaches of 3R is provided in the Law for Promotion of Effective Utilization of Resources, successor of the Law for the Promotion of Utilization of Recycled Resources, and then extensive effort have been made to disseminate 3Rs since 2004 when the month is renamed to "The month for promoting 3Rs".

The 3R Logo

This is the logo created in 2003 by the Reduce, Reuse, Recycle Promotion Association to encourage active participation and cooperation in 3R activities.

<Design Concept>

Making one step forward for people, the earth and the sky. The Rs represent "reduce", "reuse" and "recycle". The three figures are taking one step forward, evoking a sense of progress. Orange represents people, green earth, and blue the sky.
### Support system

1. **Subsidy system**
   - (1) Support scheme for medium and small size companies and venture companies (R&D project for practical applications)
     - Financial support is provided with R&D project implemented by medium and small size companies through public invitation. The rate of the financial support is within two thirds of the entire R&D cost with the upper limit of 45 M yen.
   - (2) Subsidy for R&D project of local industry creation (support projects 3R practical application)
     - Subsidy for R&D project for local industry creation. It supports R&D project for the benefit of establishing a sound material-cycle society through practical application of 3R and activating local economy by creating a new industry or business. The duration for the project is 2 years or less and the rate of the financial support is within two thirds of the entire R&D cost. (One project receives the subsidy between 30M to 100M yen a year.)

2. **Financing system**
   - Loans offered by Development Bank of Japan, Okinawa Shinko Kaihats Kiyu Koko (public loan corporation), Japan Finance Corporation for Small Business, and National Life Finance Corporation
   - Loans with low interest are available at introduction of new equipment for the benefit of 3Rs if such an activity satisfies a certain degree of requirements.

3. **Tax break system**
   - Taxes including special initial depreciation of equipment, property tax and business office tax is diminished at introduction of new equipment for the benefit of 3Rs if such an activity satisfies a certain degree of requirements.

4. **Support system by Energy Saving Law and Law for Supporting Recycling**
   - Activities including introduction of new equipment and R&D for the benefit of 3Rs; purchasing new equipment; R&D to streamline energy use; and overseas project to restrain CO2 emission caused by energy consumption in view of energy saving, are eligible to receive support system such as low interest loan, guarantee of liabilities and special cases applied to medium and small size companies on the premise that such an activity satisfies a certain degree of requirements.

5. **Environmental community business**
   - Discover the environmental community business in which local industries and citizens cooperate through public invitation and support them to launch and grow their business as a role model business.

### Eco-town Project

- Subsidy is provided to partially cover the construction fee to build a recycling facility in which local public organizations and private businesses cooperate. The subsidy rate varies depending on the project; a half of the cost is subsidized for the application of the first state-of-the-art technology in Japan; and one thirds for a pacesetting project. Subsidy for municipalities

**Overview of the project:**

**Objective:**
- (1) Regional development through activation of environmental industries making most of regional industrial experiences
- (2) Establishing a sound material-cycle society through control of waste amount and promotion of recycling considering regional uniqueness

**Procedure:**
- (1) Municipalities develop their own “Eco-town plan -city plan harmonized with environment-” with their unique features integrated.
- (2) METI and the Ministry of Environment jointly approve the plan that can be a role model for other municipalities.
- (3) Financial support is provided with local public organizations and private businesses with regard to the construction of a recycling facility for the benefit of promoting a pacesetting sound material-cycle society according to the approved plan.

Note: Although the approval system for eco-town project (2) is continuously put in place, the financial support (3) was abolished due to the structural reform as of FY 2005.

**Areas approved for Eco-town project (As of September 2005: 25 regions)**

- More details with regard to (1), (1) and (2), contact engineering department of the local bureau of economy and industry
- More details with regard to (2) and (3), call 03 (3501) 1511 (Recycling Promotion Dept. Industrial Science and Technology Policy and Environment Bureau, METI)
- More details with regard to (4), (5) and (6), call 03 (3501) 1511 (Harmonized Industry Promotion Dept. Industrial Science and Technology Policy and Environment Bureau, METI)
Local contact

Ministry of Economy, Trade and Industry
METI Hokkaido Natural Resources, Energy and Environment Department Environmental Protection Administration Division
2-1-1 Kitahachijo Nishi Kitaku Sapporo city 060-0808
Tel: 011-709-1754 (direct)
http://www.hkd.meti.go.jp/information/kanene/kankyo.htm

METI Tohoku Natural Resources, Energy and Environment Department Recycling Industry Promotion Division
3-3-1 Honcho Aobaiku Sendai city 980-8403
Tel: 022-263-1206 (direct)
http://www.tohoku.meti.go.jp/kankyo/index.htm

METI Kanto Natural Resources, Energy and Environment Department Environmental Protection and Recycling Division
1-1 Shinshin Chuuiku Saitama city 330-9715
Tel: 048-600-0202 (direct)

METI Chubu Natural Resources, Energy and Environment Department Environmental Protection and Recycling Division
2-5-2 Sanremaru Nakaoku Nagoya city 460-8610
Tel: 052-951-2768 (direct)

METI Kinki Natural Resources, Energy and Environment Department Environmental Protection and Recycling Division
1-6-44 Otemae Chuoiku Osaka city 540-8535
Tel: 06-6966-6018 (direct)
http://www.kansai.meti.go.jp/kankyo.html

METI Chugoku Natural Resources, Energy and Environment Department Environmental Protection and Recycling Division
6-30 Hachibori Nakaoku Hiroshima city 730-8531
Tel: 082-224-5676 (direct)
http://www.chugoku.meti.go.jp/policy/energy.html

METI Shikoku Natural Resources, Energy and Environment Department Environmental Protection and Recycling Division
1-10-6 Bancho Takamatsu city 760-8512
Tel: 087-834-3954 (direct)
http://www.shikoku.meti.go.jp/1_seisaku/index.htm#kankyo

METI Kyushu Natural Resources, Energy and Environment Department Environmental Protection and Recycling Division
2-11-1 Hakataeki higashi Hakataku Fukuoka city 812-8546
Tel: 092-482-5471 (direct)
http://www.kyushu.meti.go.jp/seisaku/recycle/frame.htm

Okinawa General Bureau Department of Economy, Trade and Industry Environmental Protection and Natural Resources Division
2-2-17 Maeshima Naha city 900-8530
Tel: 098-884-2065 (direct)
http://www.ogb.go.jp/move/pickup/kankyo/01.htm

Ministry of Economy, Trade and Industry Industrial Science and Technology Policy and Environment Bureau Recycling Promotion Division
1-3-1 Kasumigaseki Chiyodaku Tokyo 100-8901
Tel: 03-3501-4978 (direct)
http://www.meti.go.jp/policy/recycle/

Visit the website to study more about “3R policy”.
Update of activities, legal information, and statistical information is available.

http://www.meti.go.jp/policy/recycle/