

Environment and Ecology

# Waste management 2





# The Basic Law for Establishing the Recycling-Based Society

## 循環型社会形成推進基本法

promotes two concepts as the base of its policies:

the responsibility of waste generator

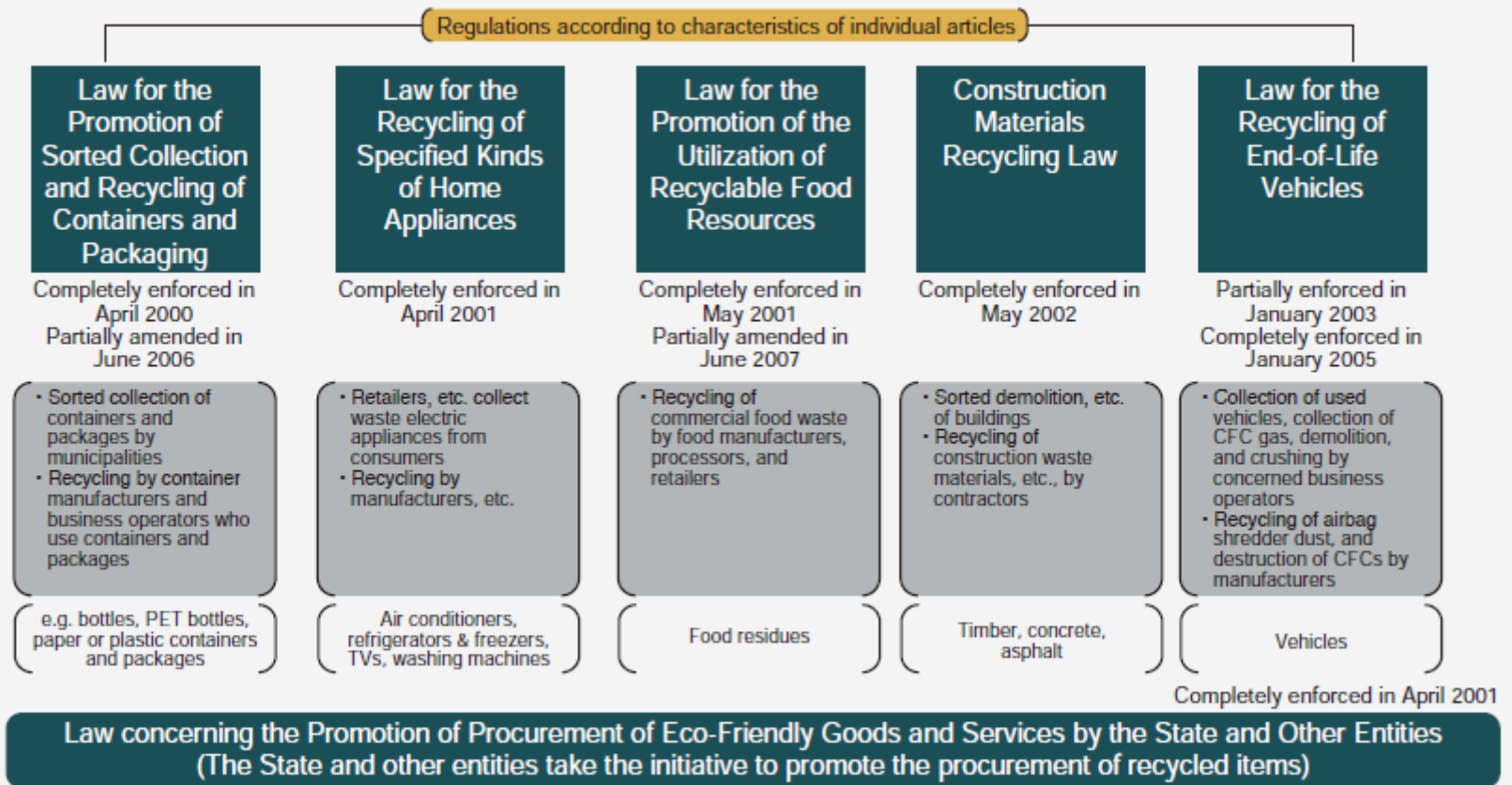
and

extended producer responsibility

# Extended Producer Responsibility (EPR)

## 擴大生產者責任

is an idea that  
a producer bears a certain responsibility  
(physical or financial responsibility) for  
the reuse, recycling, and disposal of the  
products it produced even after the  
products were used and then disposed of.



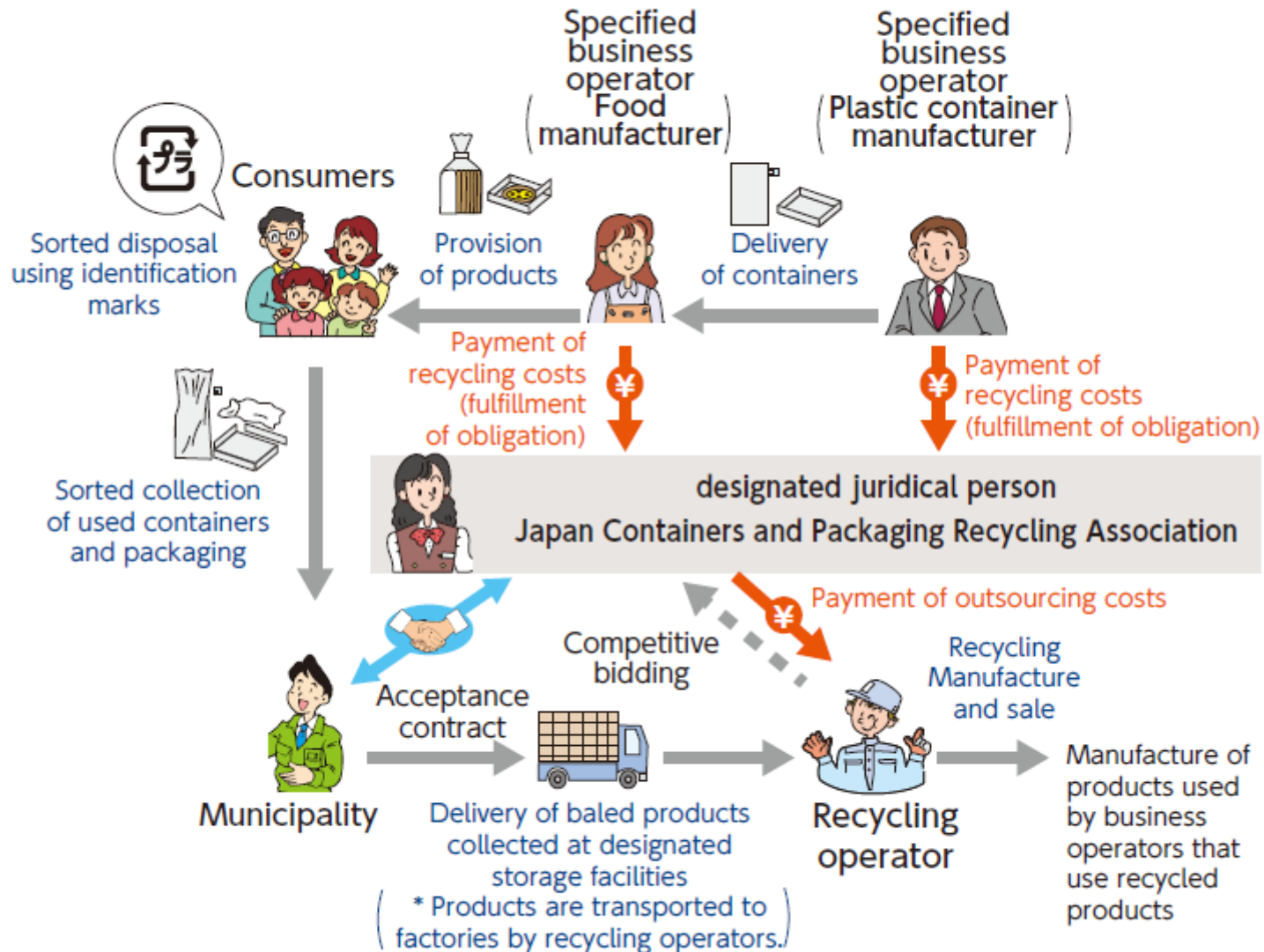
Source: Ministry of the Environment

Establishing a sound material-cycle society,  
Ministry of the Environment (2010)

# Law for the Promotion of Sorted Collection and Recycling of Containers and Packaging (Containers and Packaging Recycling Law)

容器包装リサイクル法

■ Flows of recycling costs and containers and packaging  
(example: plastic containers and packaging)





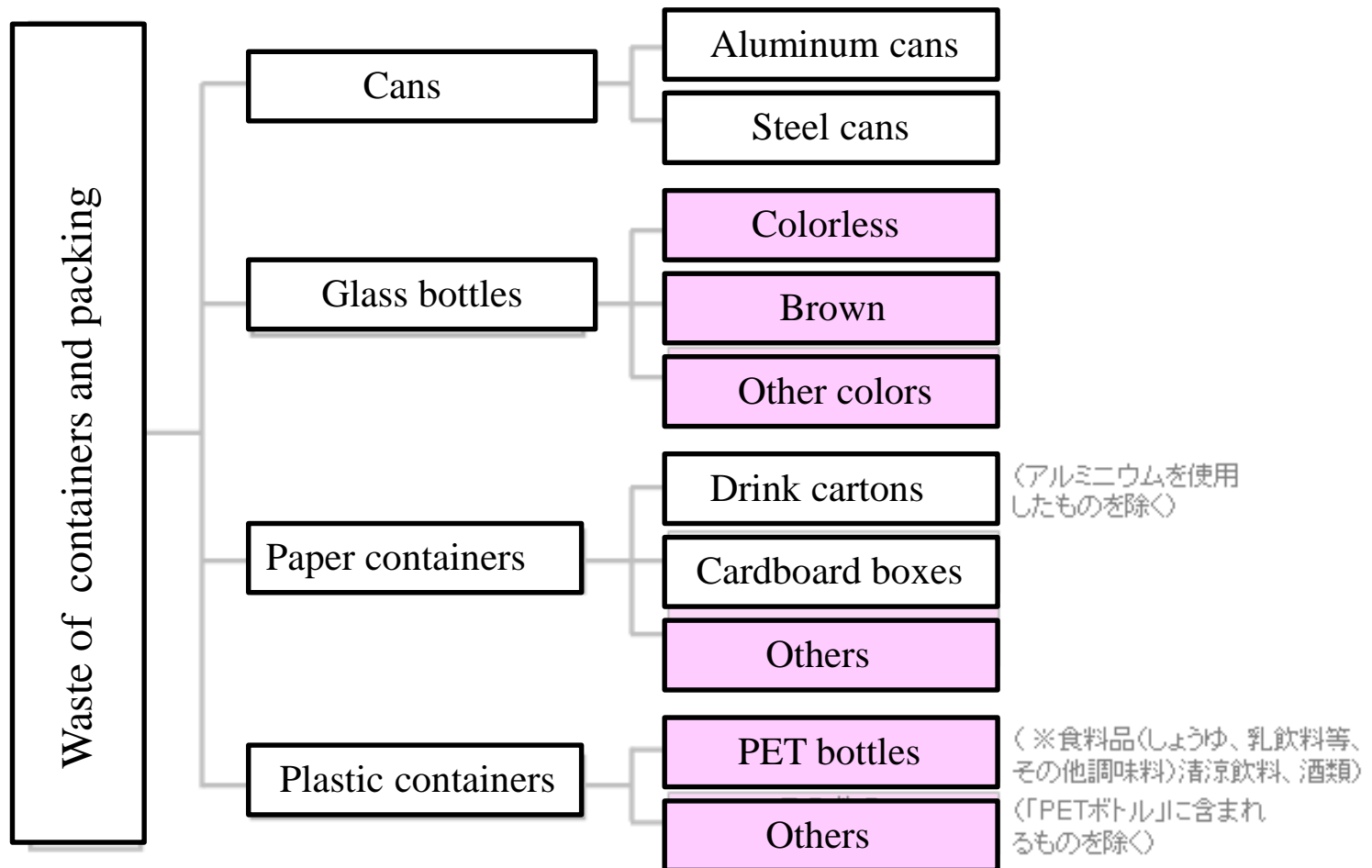
Source: Compiled from a figure on the website of the Japan Containers and Packaging Recycling Association

History and Current State of Waste Management in Japan,  
Ministry of the Environment (2014)



An identification labeling  
for sorted collection

-  For which specified business operator has the responsibility for recycling
-  For which specified business operator has no responsibility for recycling (valuables)

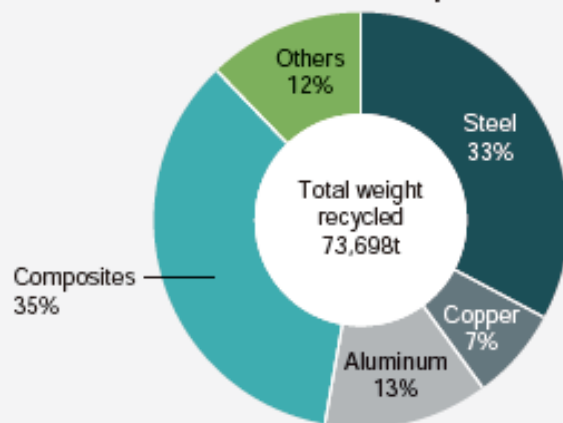




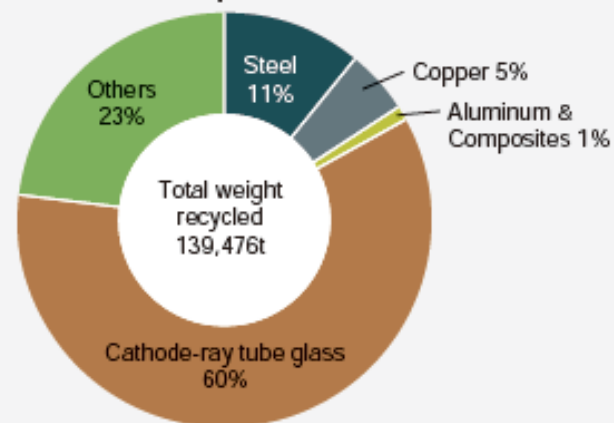
# Law for the Recycling of Specified Kinds of Home Appliances (Home Appliance Recycling Law) 家電リサイクル法

- Retailers, etc. collect waste electric appliances from consumers
- Recycling by manufacturers, etc.
- household air-conditioners, televisions, refrigerators and freezers, washing machines and clothes dryers

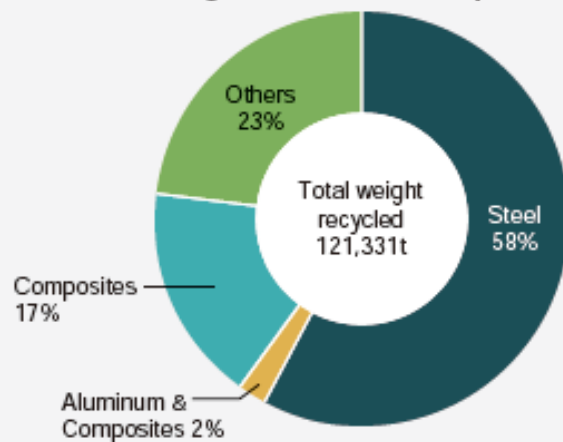
**Air conditioner components**



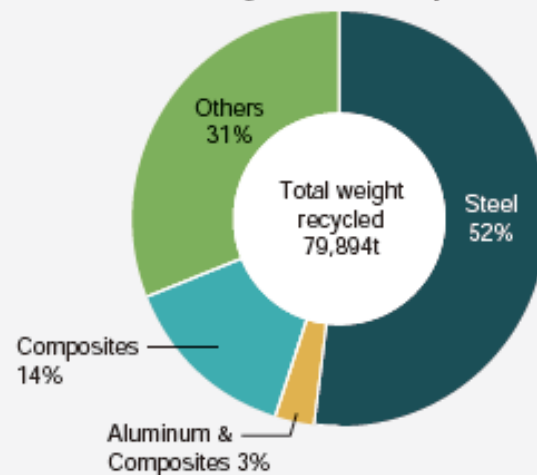
**TV components**



**Refrigerator & freezer components**



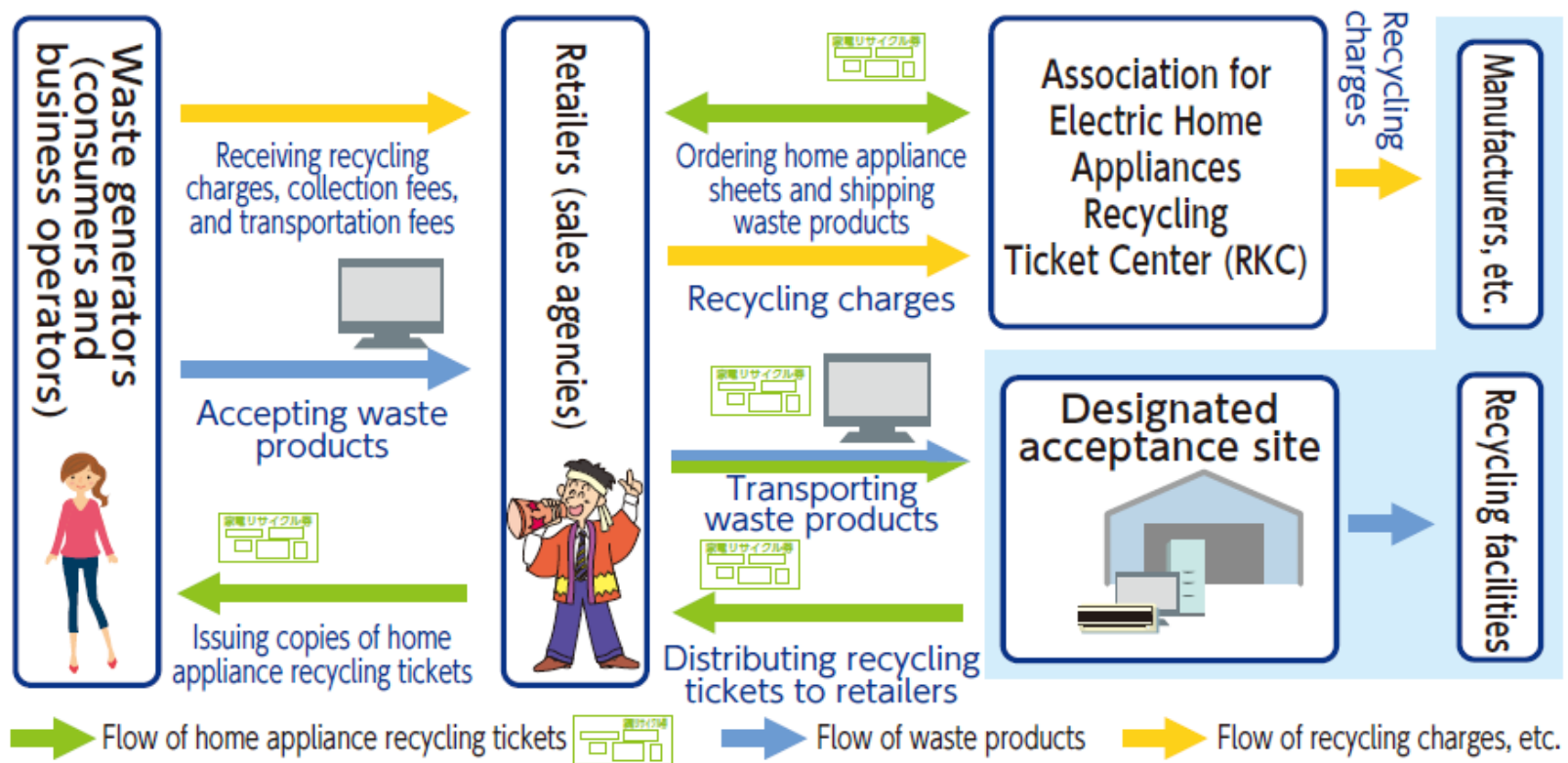
**Washing machine components**



Note: "Other valuables" refers to plastics.

Source: Ministry of the Environment, Ministry of Economy, Trade and Industry

## ■ Flows of recycling costs and waste home appliances (example: collection by retailers)



Source: Compiled from a diagram on the website of the Association for Electric Home Appliances

History and Current State of Waste Management in Japan,  
Ministry of the Environment (2014)



In the Home Appliance Recycling Law, consumers pay the recycling charge when they dispose waste home appliances. There is a possibility that it might increase illegal dumping.



Illegal dumping of post-consumer use television sets

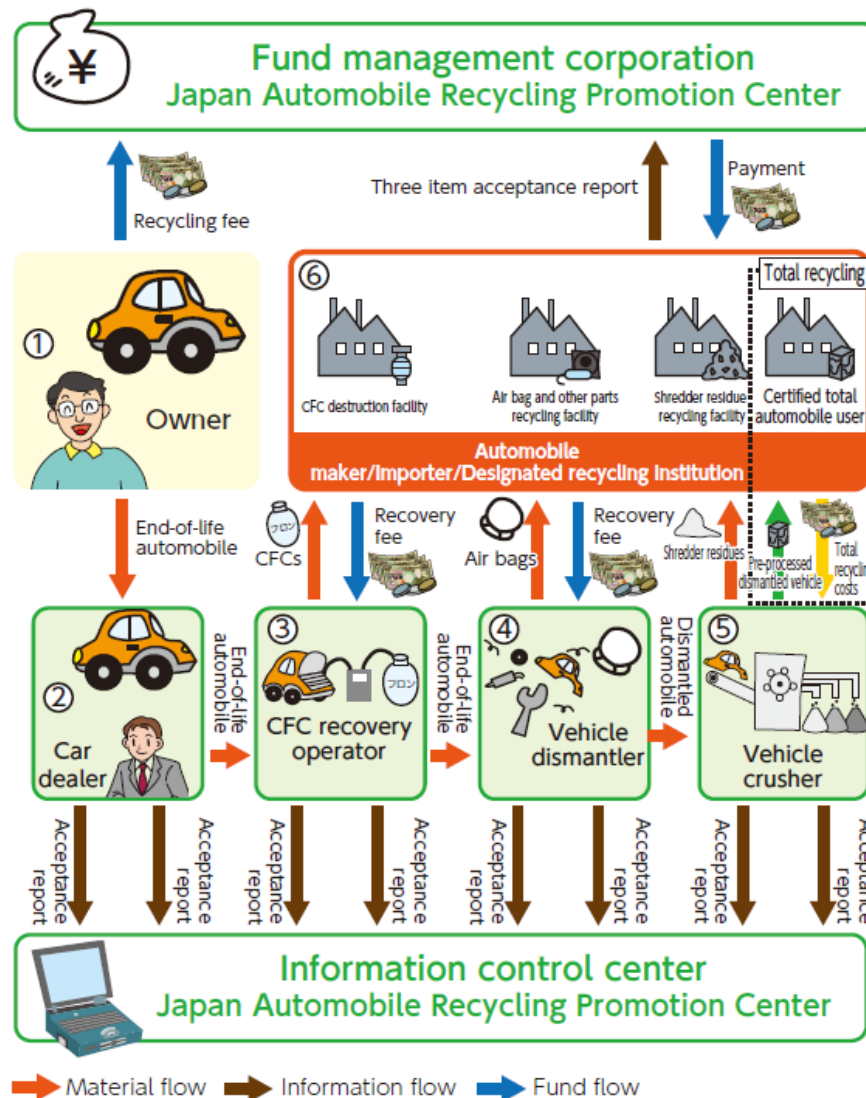
# Law for the Recycling of End-of-Life Vehicles

## (End-of-Life Vehicle recycling Law)

### 自動車リサイクル法

- Collection of used vehicles, collection of CFC gas, demolition, and crushing by concerned business operators
- Recycling of airbag shredder dust, and destruction of CFCs by manufacturers





※Total recycling

Total recycling refers to dissolving all parts of a dismantled vehicle to use them as iron and steel manufacturing materials. Total recycling makes it possible to recycle almost the entire dismantled vehicle without generating shredder residues.

※Certified total user

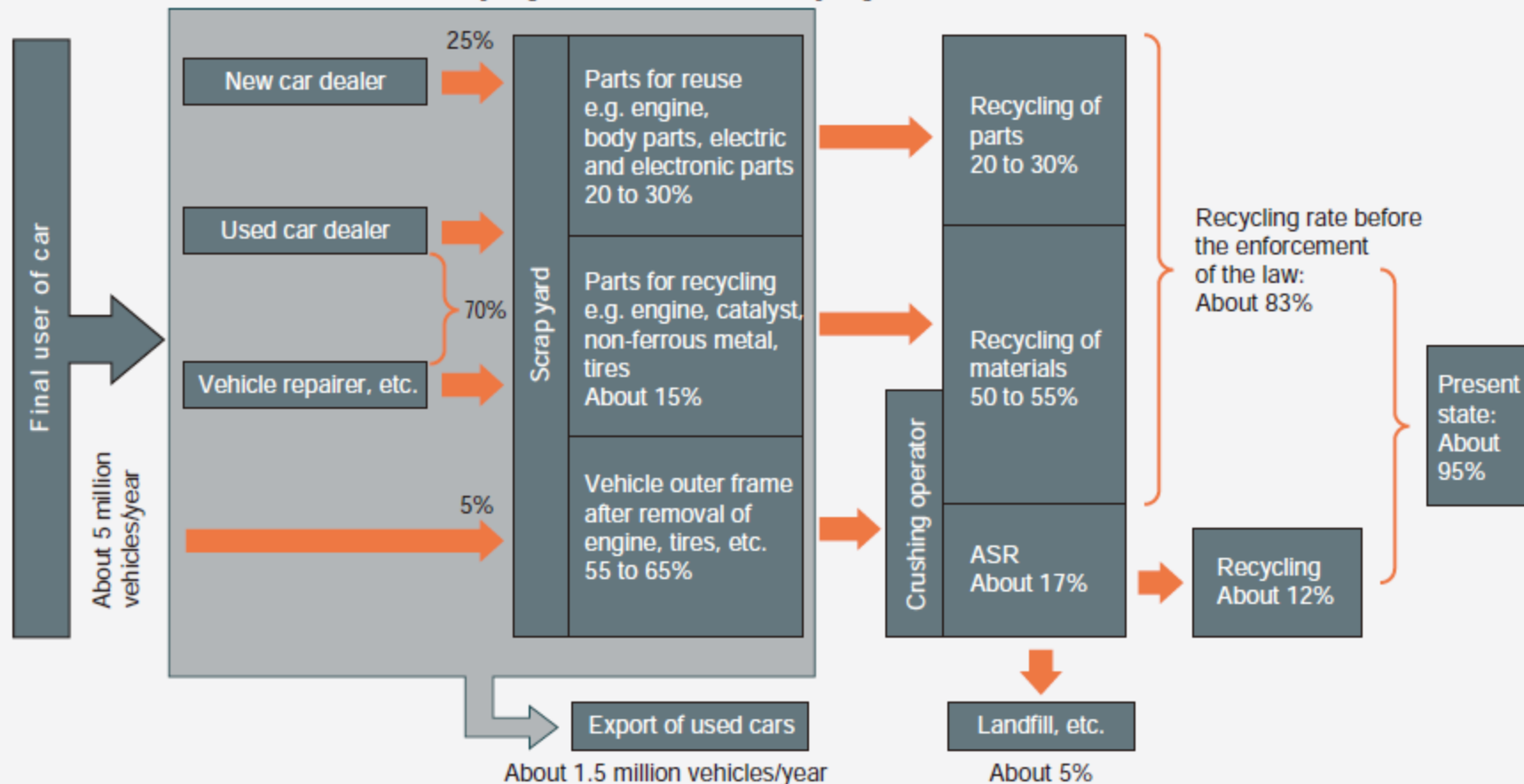
If an automobile maker or importer that has a consignment contract with a vehicle crusher or dismantler delivers end-of-life automobiles to a domestic business operator with an electric or converter furnace, the business operator is categorized as a certified total user.

Source: Compiled based on a figure on the Japan Automobile Recycling Promotion Center website

History and Current State  
of Waste Management in  
Japan,  
Ministry of the  
Environment (2014)

**Figure 2-29 End-of-life vehicle disposal flow (fiscal year 2008)**

Due to the enforcement of the Law for the Recycling of End-of-Life Vehicles, recycling rate of vehicles increased to about 95%.



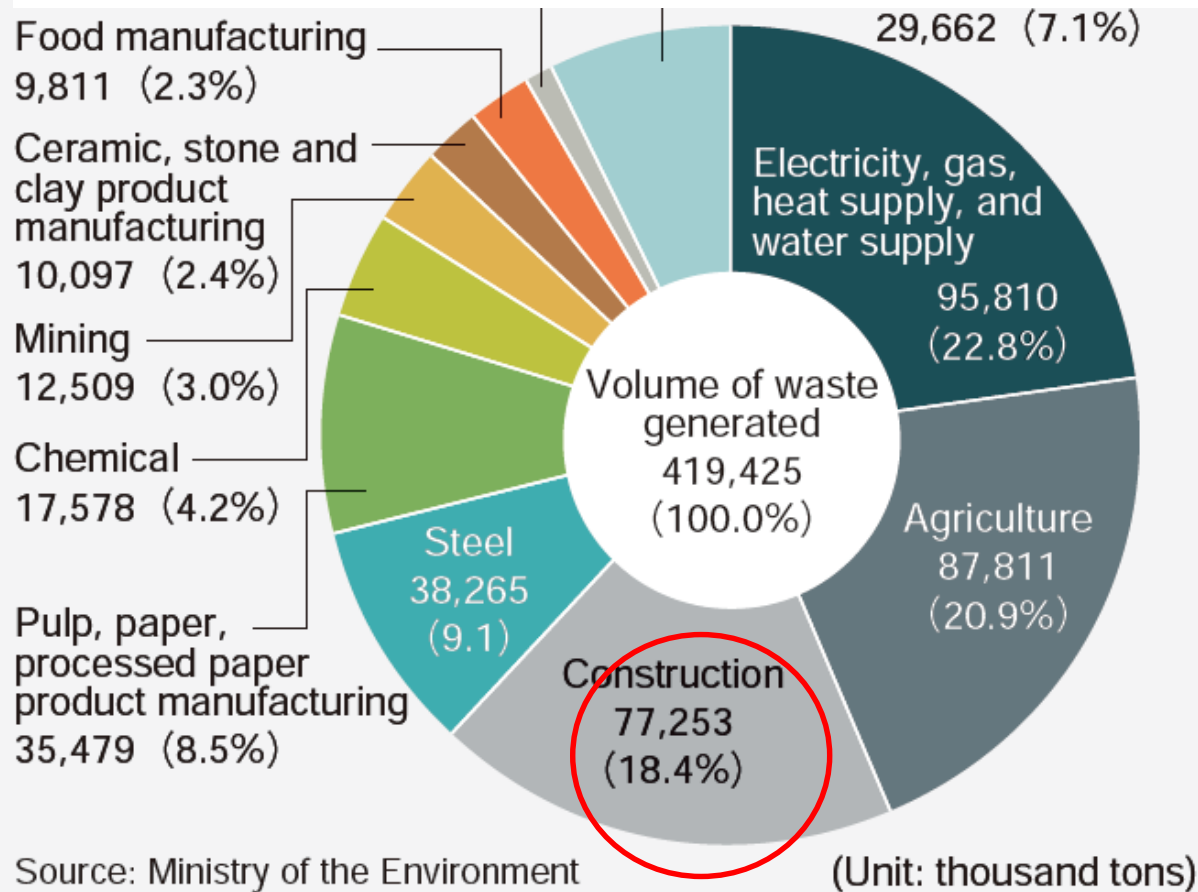
Source: Created based on "Report on Assessing and Reviewing the Execution Status of Automobile Recycling System" released in January 2010 by the Automobile Recycling Working Group in the Waste and Recycling Subcommittee under the Industrial Structure Council and the Automobile Recycling Technical Committee in the Waste and Recycling Committee under the Central Environment Council

# Law Concerning Recycling of Materials for Construction Works (Construction Materials Recycling Law) 建設リサイクル法

- Sorted demolition, etc. of buildings
- Recycling of construction waste materials, etc., by contractor

**Figure 2-15** Industrial waste generation by industry (fiscal year 2007)

**Building demolition generates a large amount of construction waste.**

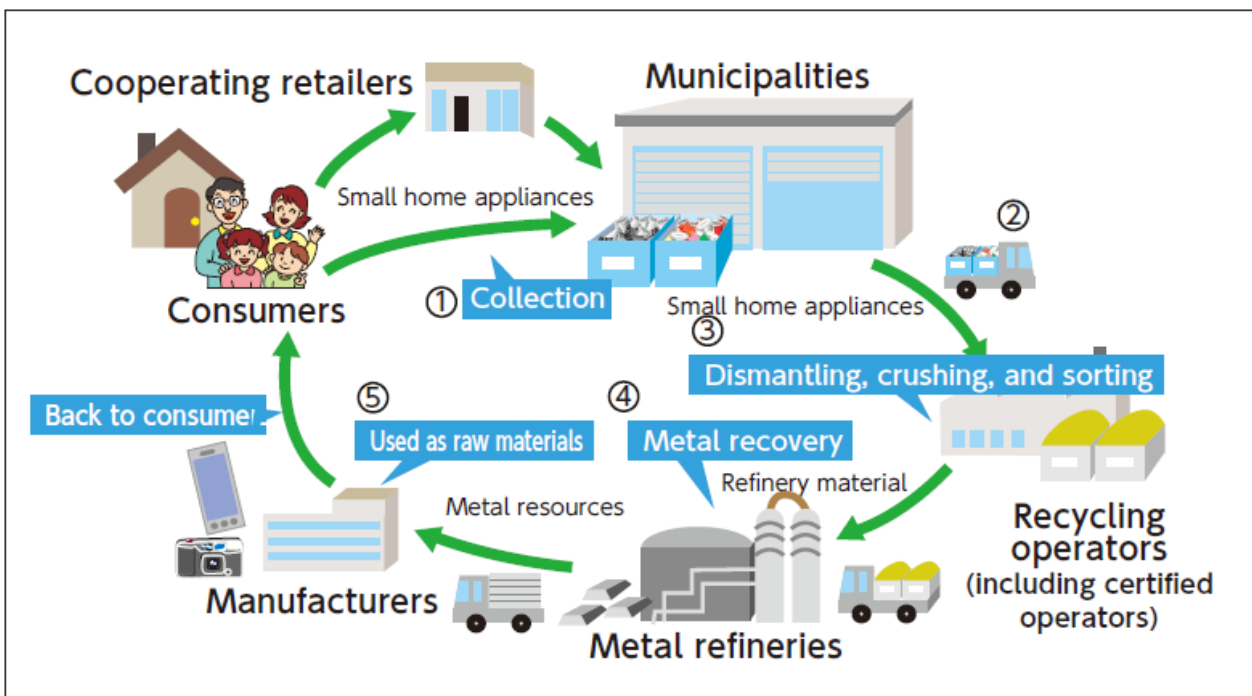


Act on Promotion of Recycling of  
Small Waste Electrical and  
Electronic Equipment (Small  
Home Appliance Recycling Act)  
小型家電リサイクル法

came into force on April 1, 2013.



# Small Home Appliance Recycling Act (enacted in 2012)



Source: Compiled from a figure in the pamphlet MOE and METI, Small Home Appliance Recycling Act Put into Effect

## Collection procedures

Collection procedures are chosen in accordance with the characteristics of individual municipalities.

### Box collection

Collection boxes for small home appliances are installed at public facilities, supermarkets, and home appliance stores in order to collect end-of-life products.



### Pick-up collection

End-of-life small home appliances are collected along with bulky waste and non-combustible waste to be sorted at waste management facilities.



### Station collection

A new category for small home appliances is created for sorted waste collection.



History and Current State of Waste Management in Japan,  
Ministry of the Environment (2014)

# Law for the Promotion of the Utilization of Recyclable Food Resources (Food Recycling Law)

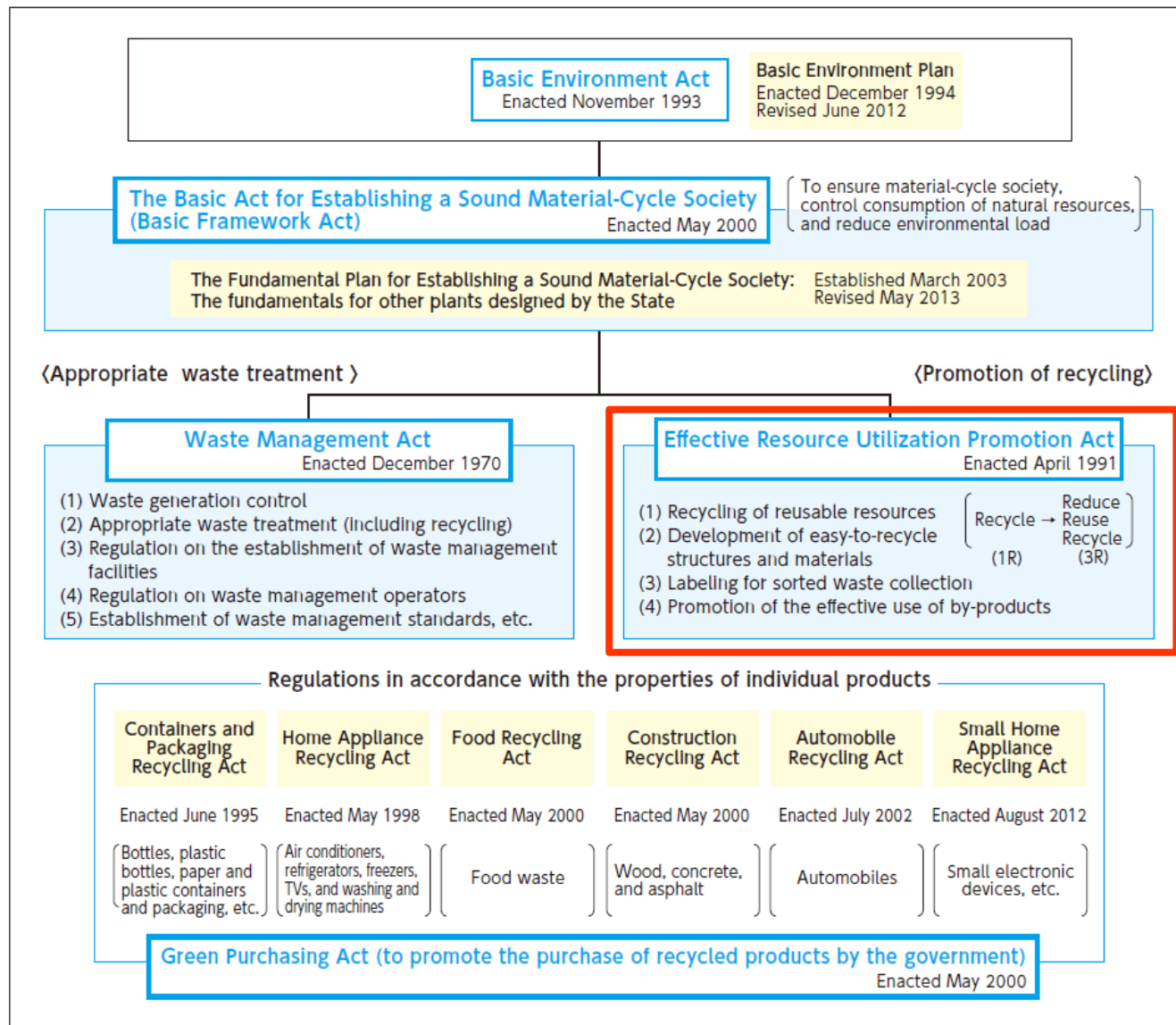
## 食品リサイクル法

- Recycling of commercial food waste by food manufacturers, processors, and retailers

# Law for Promotion of Effective Utilization of Resources 資源有効利用促進法

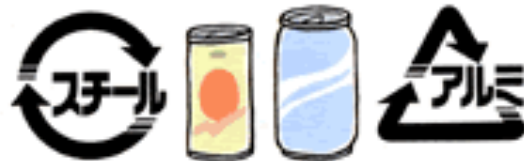
- (1) Recycling of recycled resources
- (2) Development of easy-to-recycle structure and materials
- (3) Labeling for sorted collection
- (4) Promotion of effective utilization of by-products

## Legal system for Establishing a "Sound Material-Cycle Society"



History and Current State of Waste Management in Japan,  
Ministry of the Environment (2014)

指定表示製品（分別回収促進のための表示を行うことが求められる製品）



スチール製の缶、アルミニウム製の缶  
（飲料・酒類用）



ペットボトル  
飲料・酒類・特定調味料用PETボトル



塩化ビニル製建設資材

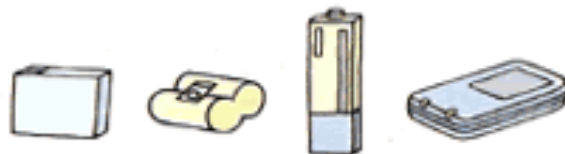


紙製容器包装  
（飲料用紙パックでアルミ  
不使用のものおよび段  
ボール製容器包装を除く）

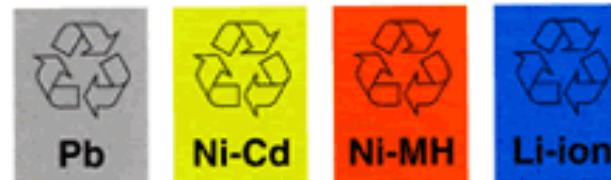


プラスチック製容器包装

（飲料・酒類・特定調味  
料用PETボトルを除く）



小形二次電池



●Products specified for labeling

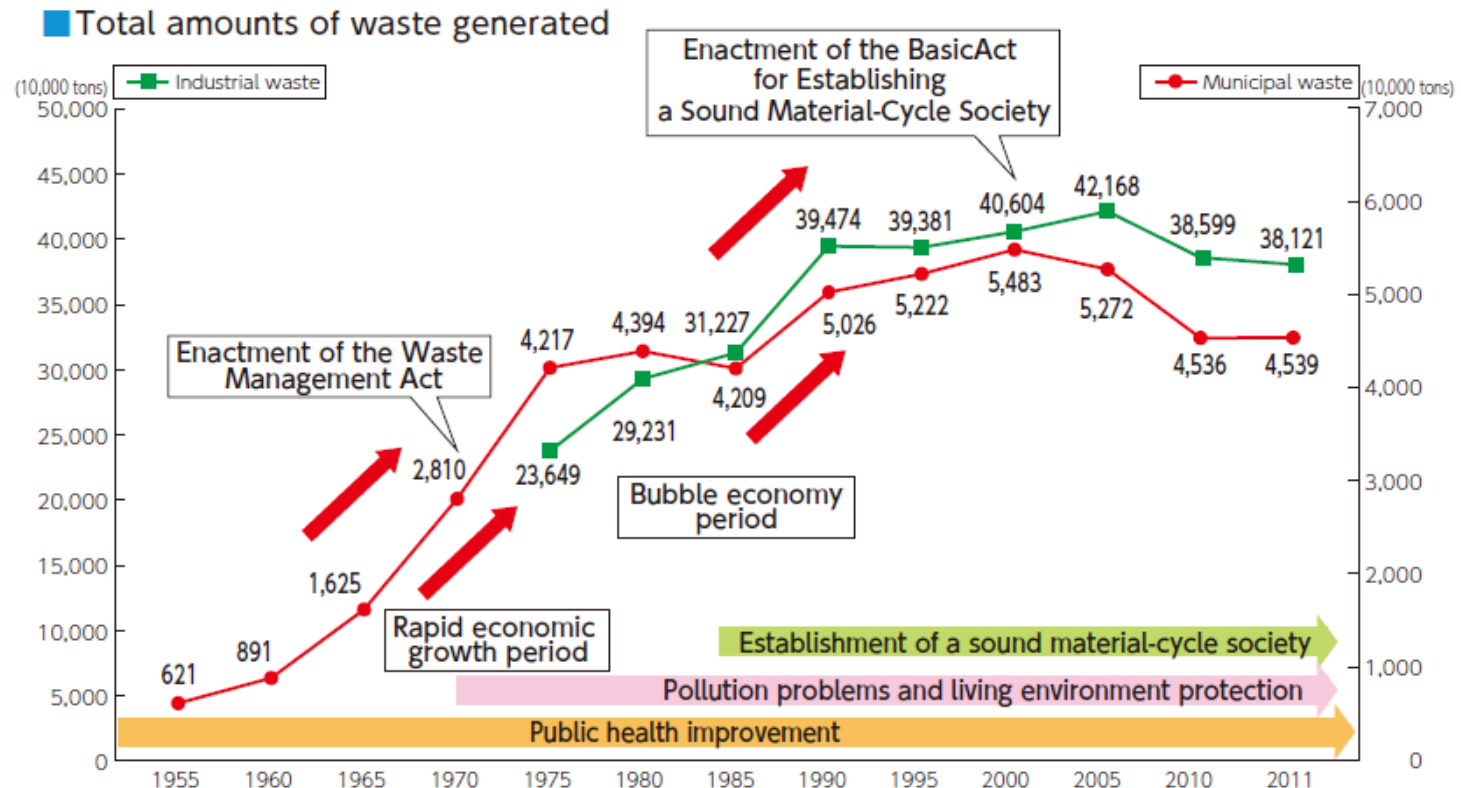
Targeted products : Seven products, including steel cans, aluminum cans, plastic bottles, and small reusable batteries

Objective : Identification labeling for sorted collection



## ■ Amounts of waste generated

The amount of municipal and industrial waste generated in Japan continued to increase over time until around 2000. Waste generation increased especially sharply during the rapid economic growth period (1960s to 1970s) and the bubble economy period (late 1980s to early 1990s). Since 2000, due partly to the effects of changes in the industrial structure and the Japanese economy, waste generation has tended to decrease as a result of progress in sorted collection, recycling and in the development of a sound material-cycle society.



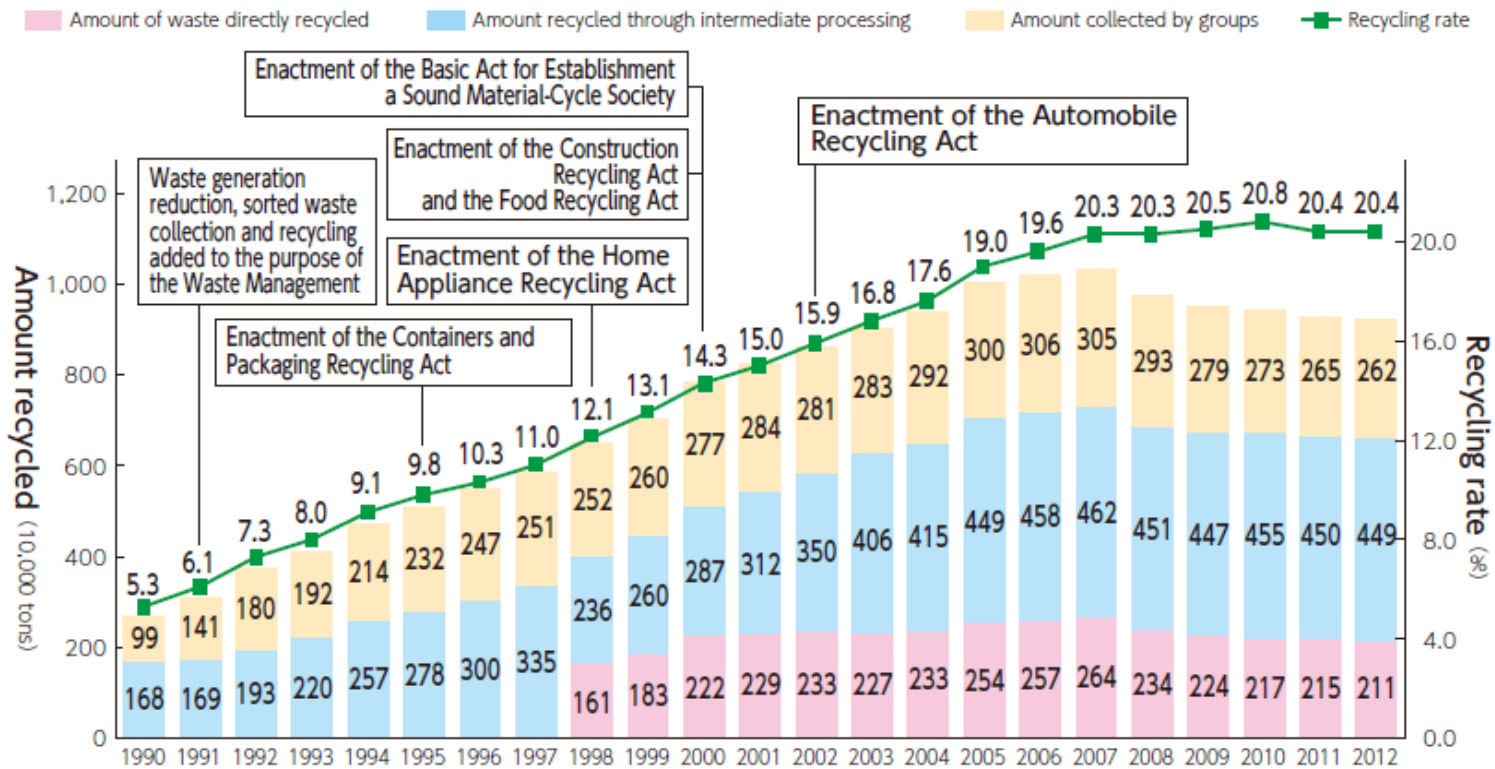
Source: Compiled from MOE, Waste Management in Japan: Survey on the Discharge and Disposal of Industrial Waste (annual editions)

History and Current State of Waste Management in Japan,  
Ministry of the Environment (2014)

## Amount of Municipal waste recycled and the recycling rate

In addition to the Basic Recycling Act, the Japanese government has enacted a variety of specific recycling acts since the 1990s in order to effectively promote the recycling of municipal waste.

### Changes in the amount of waste recycled and the recycling rate



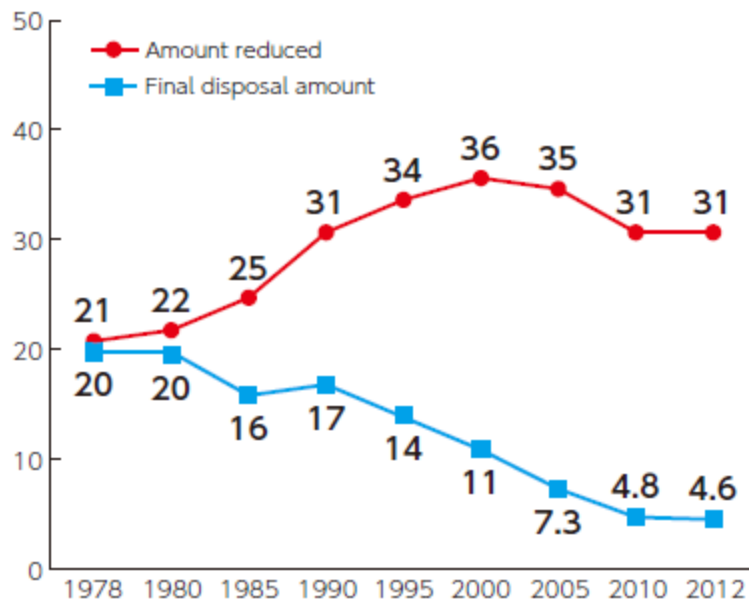
Source: Compiled from MOE, Waste Management in Japan (annual editions)

History and Current State of Waste Management in Japan,  
Ministry of the Environment (2014)

## ▣ Amounts of final waste disposal and waste reduction

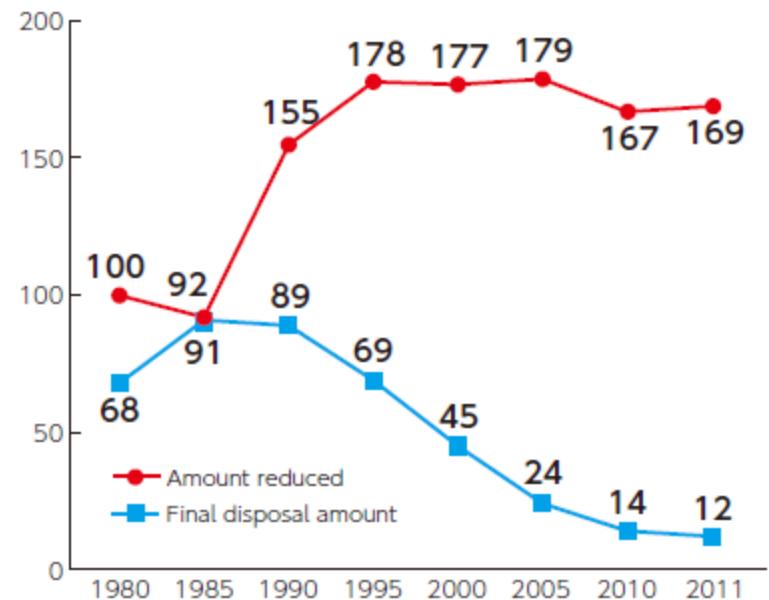
The Japanese government has strived to reduce the ever-growing amount of waste through incinerating and recycling waste. Since 2000, the government has also strived to reduce waste disposal by defining numerical targets for the final disposal amount in the Basic Recycling Plan as well as by implementing systematic and effective measures to incinerate and recycle waste. As a result of such efforts, the final waste disposal amount has greatly decreased, as shown in the graphs below.

■ Municipal waste (Units: million tons)



Source: Compiled from MOE, Waste Management in Japan (annual editions)

■ Industrial waste (Units: million tons)



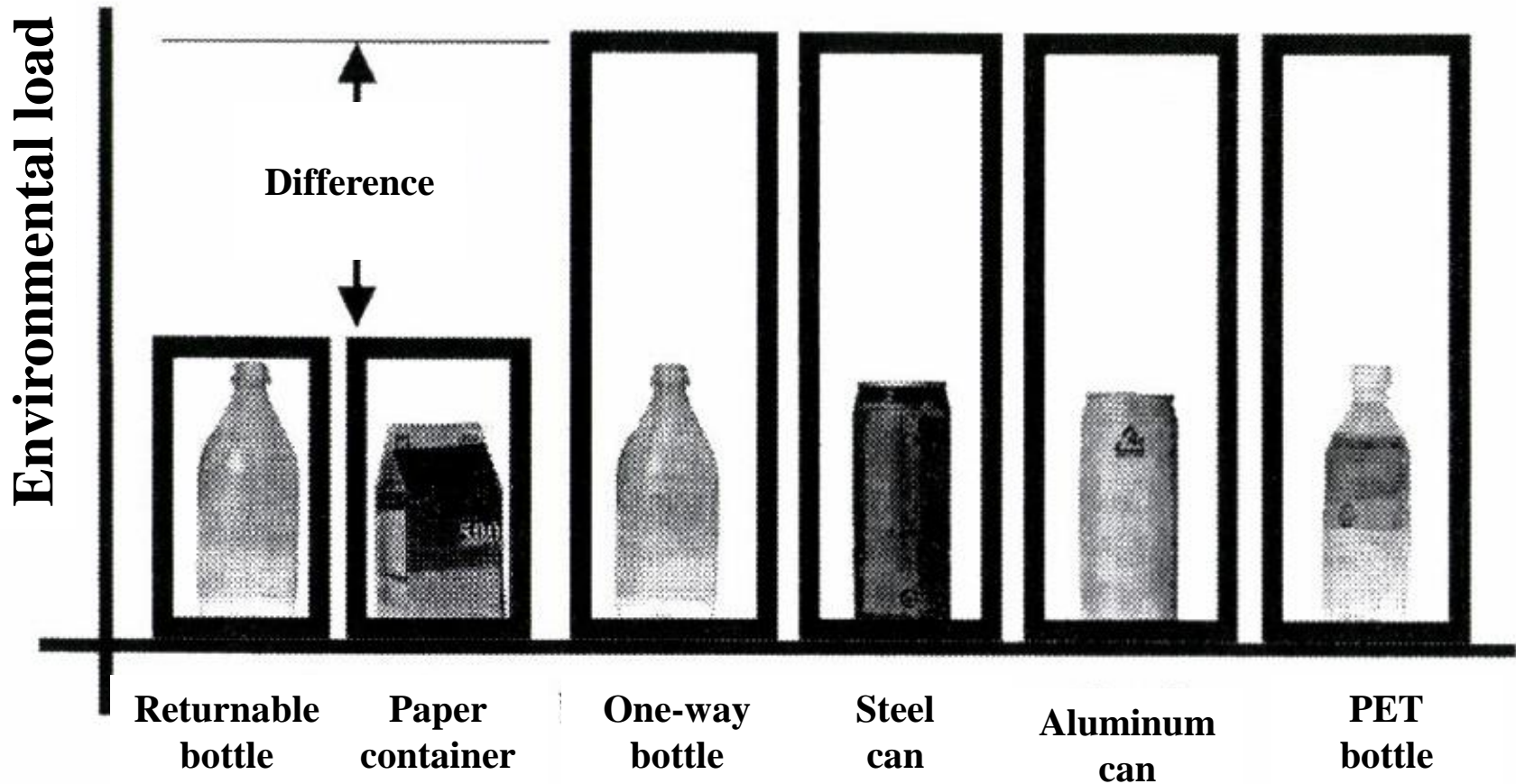
Source: Compiled from MOE, Survey on the Discharge and Disposal of Industrial Waste (annual editions)

Key word

# Life-cycle Assessment (LCA)

is a technique to assess environmental impacts associated with all the stages of a product's life from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, and disposal or recycling.

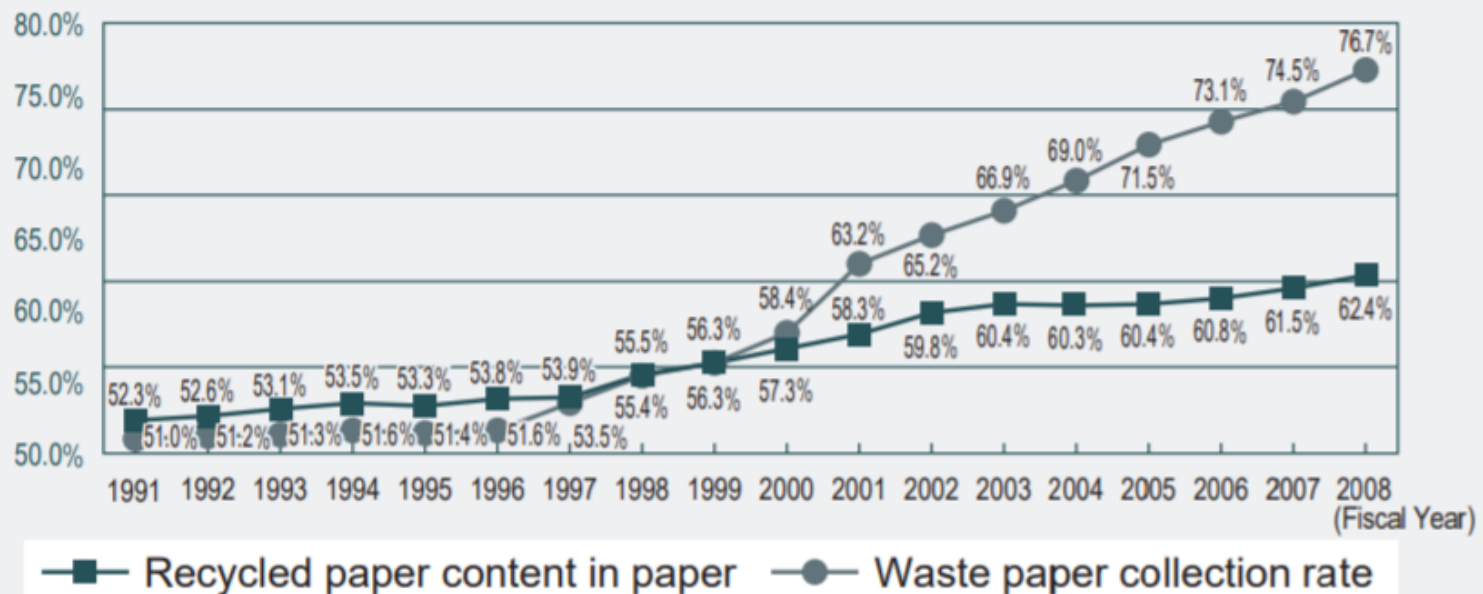
[https://en.wikipedia.org/wiki/Life-cycle\\_assessment](https://en.wikipedia.org/wiki/Life-cycle_assessment)



## Difference in environmental load between containers

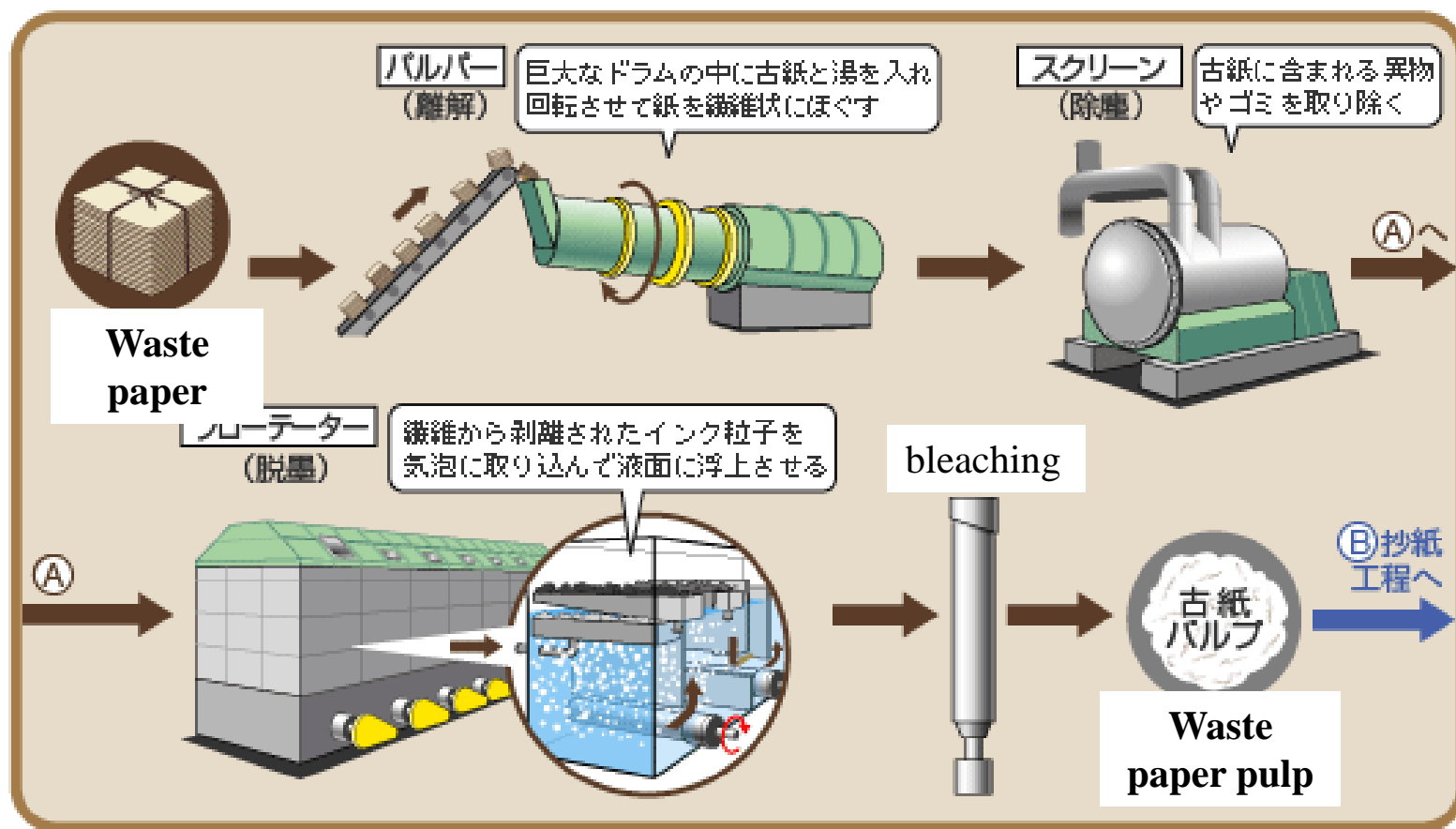


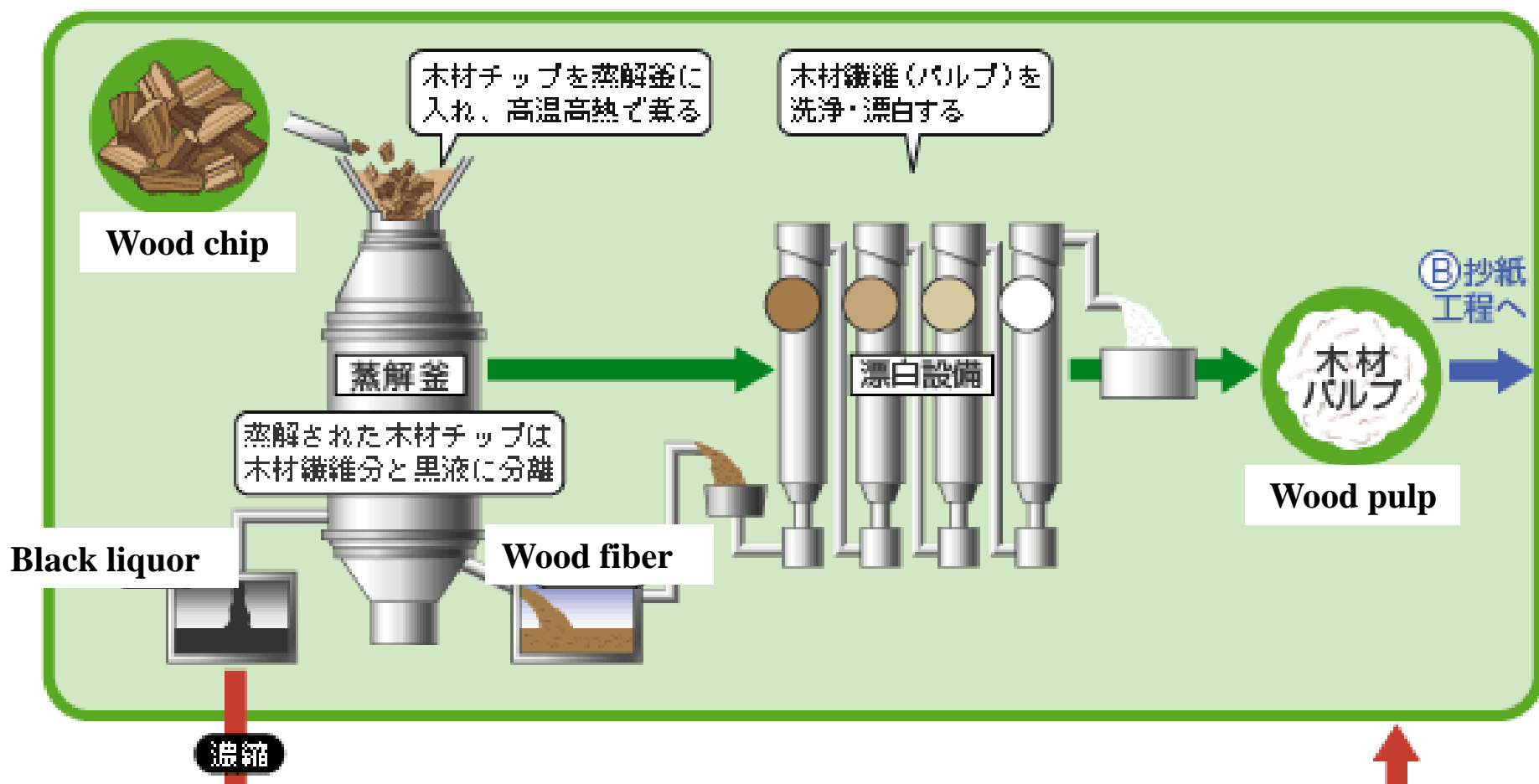
## Figure 2-23 Collection Rate and Reuse Rate of Paper



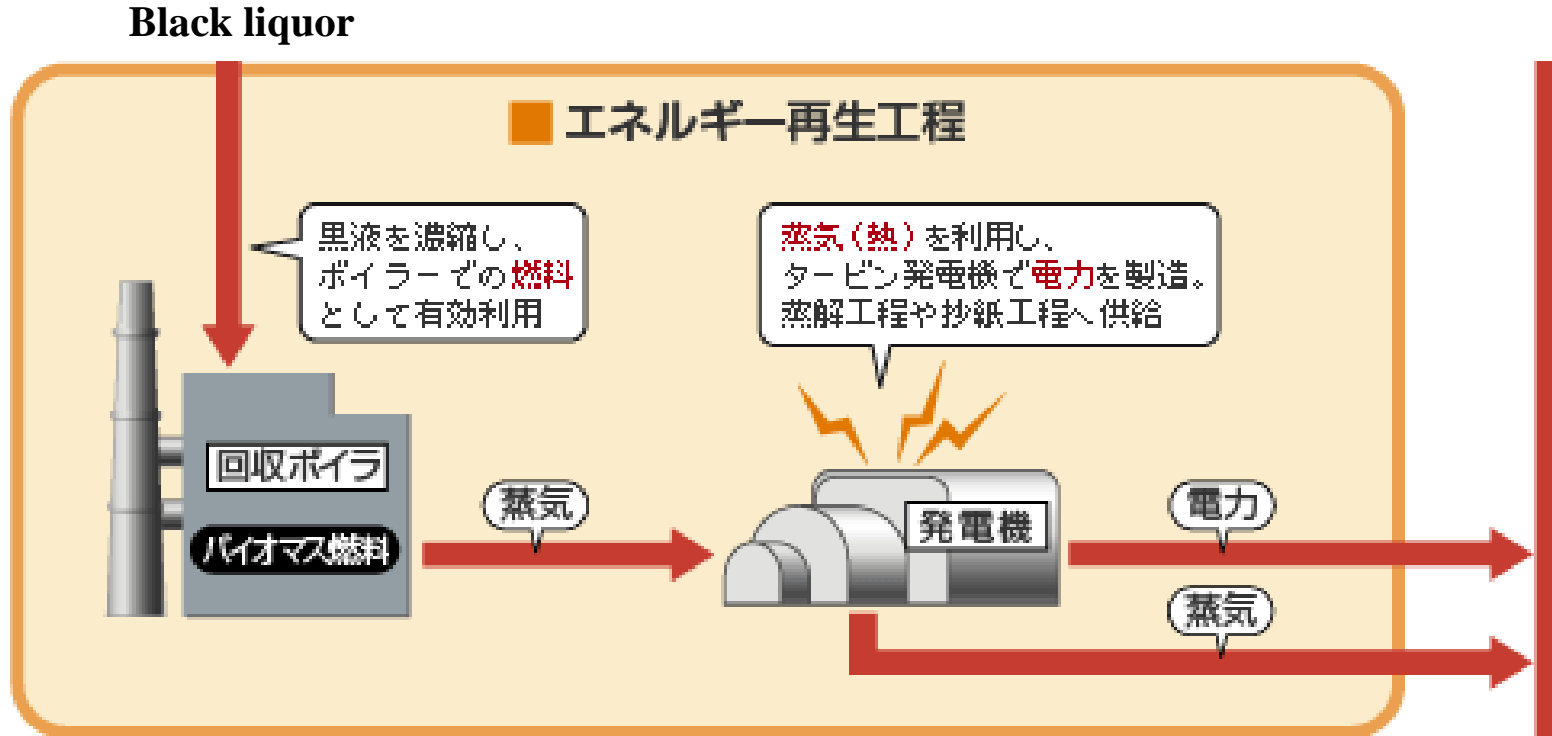
Note: Due to a change in classification types, the calculation method of waste paper collection rate was changed in fiscal year 2000; concerning the export and import of paper and cardboard, some types that had been formerly classified as paper secondary products were reclassified as printing paper in the paper category.

Source: Paper Recycling Promotion Center





Black liquor is used as an energy source for power generator.



Black liquor is the waste product from the kraft process when digesting pulpwood into paper pulp removing lignin, hemicelluloses and other extractives from the wood to free the cellulose fibers. [https://en.wikipedia.org/wiki/Black\\_liquor](https://en.wikipedia.org/wiki/Black_liquor)

Key word

# Ecological Rucksack

An ecological rucksack is the total quantity (in kg) of materials moved from nature to create a product or service, minus the actual weight of the product.

It looks at hidden material flows.

Steel 21kg

Aluminum 85kg

Recycled aluminum 3.5kg

Gold 540,000kg

Diamond 53,000,000kg



## Recycling of waste :

1. reduces virgin materials.
2. reduces final disposal of the waste.

but

3. needs energy and may increase energy consumption and CO<sub>2</sub> emission.

# China enforced an import ban on plastic waste in January 2017.

Before then, Japan had exported much of their plastic waste to China at low prices instead of treating it at home.

Japanese consumers are going to need to start reducing and reusing their plastic containers.

# Cabinet Decision on the Bill for the Act on Promotion of Resource Circulation for Plastics (on June 4, 2021)

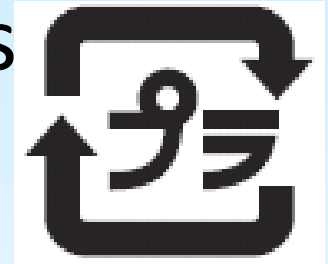
## 2. Outline of the bill

- (1) Guidelines for design of plastic-containing products
- (2) Rational use of specified plastic-containing products
- (3) Sorted collection and recycling by municipalities
- (4) Collection and recycling by manufacturers, sellers and other businesses
- (5) Waste reduction and recycling by waste generating businesses

[https://www.meti.go.jp/english/press/2021/0309\\_001.html](https://www.meti.go.jp/english/press/2021/0309_001.html)

# Recyclable plastics

Plastics containers with 'plastic mark' for which specified business operators (e.g. plastic container manufacturers) pay the recycling cost.



under the Containers and Packaging Recycling Law

## Other plastics

Items made of plastic only, other than recyclable plastics.