Comprehensive 3R Policy Framework towards a Sound Material Cycle Society in Japan

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1. Waste Management and 3R in Japan

Basic Information on Japan

- A crowded island nation with limited land area
  →Difficulty securing sites for final disposal

- A mostly warm and humid climate causing organic matters to decay easily
  →Sanitation treatment is vital.

-In particular, it is extremely difficult to secure final disposal sites in major urban areas, even though that is the very place where huge amounts of waste are generated.

⇒Measures for dealing with waste problems: incineration-based sanitation treatment, 3R initiatives for waste generation reduction, etc.

Metropolitan area

Climate with a lot of precipitation

Islands scattered on the sea

Shibuya Waste Processing Factory built in the city area

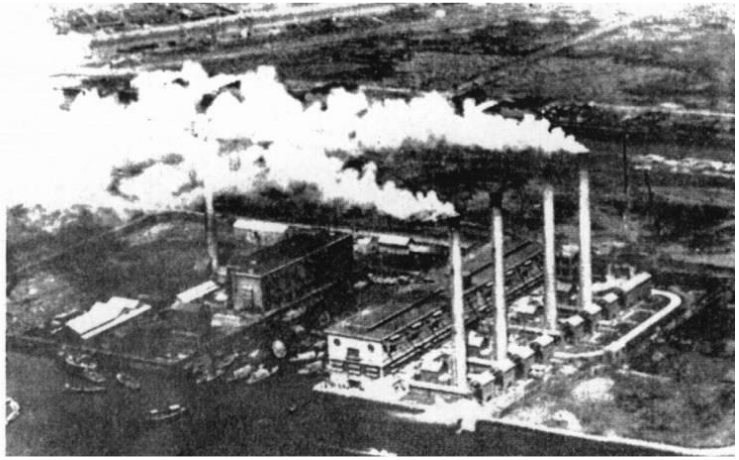
<Nationwide>
- Population: 127.51 million (10th in the world)
- Land area: 377,960 km^2
- Population density: 343.4 people/km^2

<Tokyo>
- Population: 13.23 million
(10% of the nationwide population)
- Population density: 6,015.7 people/km^2
(17 times larger than the national average)

Source: “Japan Statistical Yearbook 2014” by the Statistics Bureau, Ministry of Internal Affairs and Communications

Source:
upper left, upper right :Tokyo Metropolis
lower left :MOE Website
lower right :Clean Association of TOKYO23

The Past in Japan



The Present in Japan

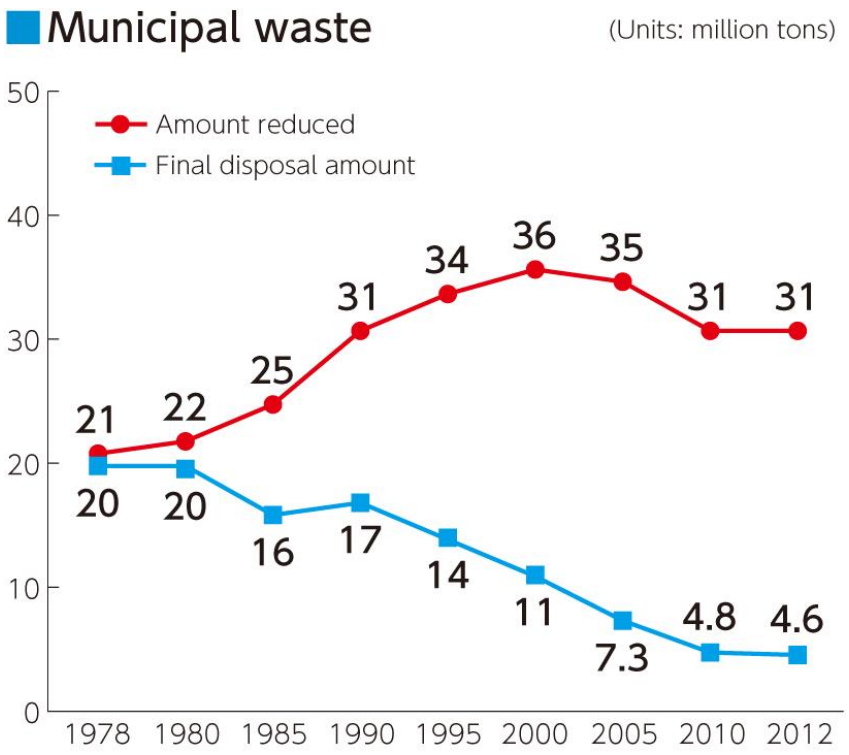
写真：水俣市

写真：東京二十三区清掃一部事務組合

Main Results Achieved by Past Measures

Amounts of final waste disposal and waste reduction

The government has strived to reduce the amount of waste through incinerating and recycling waste, leading to a drastic decrease in final waste disposal.



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

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

Public awareness toward better behavior of waste management

Sorted collection of recyclable waste

Initiatives for promoting sorted waste collection: Cooperation of residents

- Distributed flyers and handbooks to residents to promote their understanding of sorted waste collection.
- Implemented briefings by local government staff for local residents.

Source: Official website of Yokohama City

Waste incineration facilities in Japan

Shibuya Incineration Plant
Constructed in 2001

- located near Shibuya Station – most densely populated commercial area in Japan
- advanced incineration technology with a capacity of 200t/day
- sophisticated emission control for NOx, SOx, smoke, dioxins and other gases
- equipped with steam turbine generator with a maximum capacity of 4,200kW
- excess electricity being sold to Tokyo Electric Power Company.

Source: Clean Authority of TOKYO 23cities

Advantages of waste incineration

Reduction of waste volume

Incineration will reduce the weight and volume of waste (reduction in volume by 90 to 95%), which can save the lifetime of landfill sites.

Hygienic treatment of waste

Incineration will sanitize and stabilize infectious and bio-degradable substances contained in waste.

Waste to energy

Incineration will generate excess heat which could be converted to electricity and hot water used by the facility and neighboring communities (effect on CO_2 reduction as well).

3-9. Government Subsidy Program for Waste Treatment Facilities

- Long history of subsidy for waste treatment facilities exists, even in the 1950s.
- Now, subsidies for diverse types of facilities are available.

- High-efficiency waste incineration power plant
- Capacity : 230 t/day x 2 (Total 460 t/day)
- Power Generation System : Steam (12,400kw) + Gas Turbine (4,100kw)

- For example, construction of the plant (left) was supported by “Subsidy for Establishing a Sound Material-Cycle Society”:
  - 1/2 or 1/3 of the total cost (depending upon the case)
  - Local governments as beneficiary

Waste Management Law –roles and responsibilities of different entities –

Purpose: Conservation of living environment through the reduction of waste generation, proper waste separation, storage, collection, transport, recycling and disposal

Waste

Garbage and unneeded materials in solid or fluid form

Municipal Waste	Industrial Waste
Non-industrial waste (household refuse, etc.)	Cinders, sludge, waste oil, waste plastics, etc., generated by business activities

Government • Basic policy formulation and planning • Setting of management and facility standards • Emergency measures, etc.

Municipalities

Municipalities have responsibilities to:
- Formulate general waste management plans
- Manage in accordance with management standards to ensure that waste does not cause adverse effects on living environment

Permit supervision

General waste management contractors
- **Business permits**
- Observation of general waste management standards, etc.

Prefectures

Permit supervision

General waste management facilities
- Installation, transfer permits, etc.

Generators have **responsibilities to:**
- Manage their industrial waste
- Observe industrial waste management and facility standards
- Observe commission standards

Supervision

Industrial waste management contractors
- **Business permits**
- Observation of industrial waste management standards, etc.

Permit supervision

Industrial waste management facilities
- Installation, transfer permits, etc.

Permit supervision

Prefectures

*A special government-certified system exists for the promotion of wide-area recycling by manufacturers.

2. Japan’s Policies towards Realizing a Sound Material-Cycle Society

Problems and measures regarding waste management and 3R

How we have dealt with waste management focusing on 1. public health, 2. pollution prevention and environmental protection and 3. establishment of a sound material-cycle society, as well as high priority issues in different periods are shown in the following table.

History of legal systems regarding the development of a sound material-cycle society (post-war period to the present)

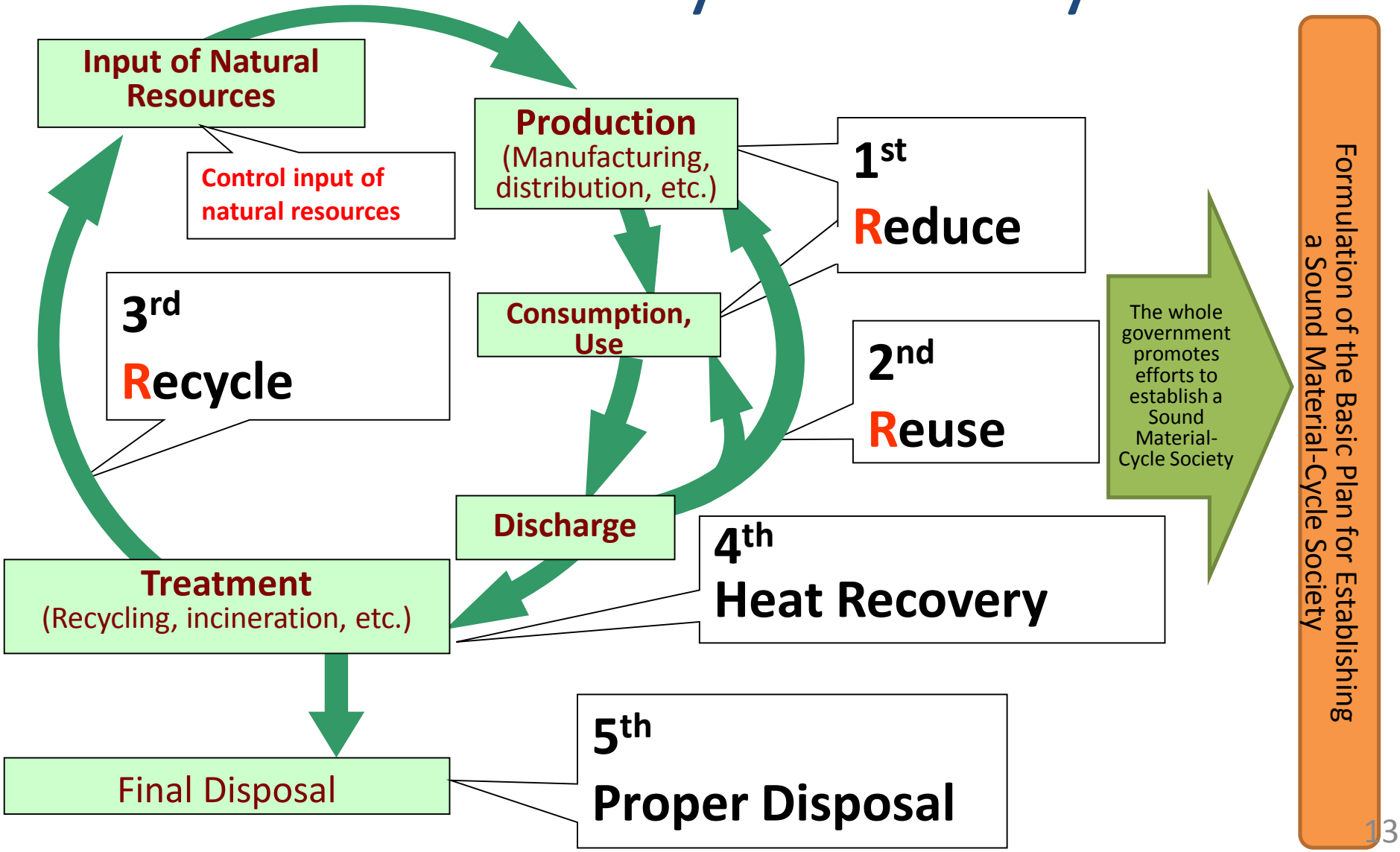
Period	Major issues	Laws enacted
Post-war period to the 1950s	• Waste management for environmental sanitation • Maintenance of a healthy and comfortable living environment	• Public Cleansing Act (1954)
1960s to 1970s	• Increase in the amount of industrial waste and emergence of pollution problems as a result of rapid economic growth • Waste management for environmental protection	• Act on Emergency Measures concerning the Development of Living Environment Facilities (1963) • Waste Management Act (1970) • Revision of the Waste Management Act (1976)
1980s	• Promotion of the development of waste management facilities • Environmental protection required for waste management	• Wide-area Coastal Environment Development Center Act (1981) • Private Sewerage System Act (Johkasoh Law) (1983)
1990s	• Waste generation control and recycling • Establishment of various recycling systems • Management of hazardous substances (including dioxins) • Introduction of a proper waste management system to cope with diversification in the type and nature of waste	• Revision of the Waste Management Act (1991) • Act to Promote the Development of Specified Facilities for the Disposal of Industrial Waste (1992) • Japanese Basel Act (1992) • Basic Environment Act (1993) • Containers and Packaging Recycling Act (1995) • Revision of the Waste Management Act (1997) • Home Appliance Recycling Act (1998) • Act on Special Measures against Dioxins (1999)
2000–	• Promotion of 3R measures aimed at the establishment of a sound material-cycle society • Enhancement of industrial waste management • Enhancement of illegal dumping regulations	• Basic Act for Establishing a Sound Material-CycleSociety (2000) • Construction Recycling Act (2000) • Food Recycling Act (2000) • Revision of the Waste Management Act (2000) • Act on Special Measures concerning Promotion of Proper Treatment of PCB Wastes (2001) • Automobile Recycling Act (2002) • Act on Special Measures concerning Removal of Environmental Problems Caused by Specified Industrial Wastes (2003) • Revision of the Waste Management Act (2003 to 2006, 2010) • Small Home Appliance Recycling Act (2013)

Public health improvement

Pollution problems and living environment protection

Establishment of a sound material-cycle society

The Concept of a Sound Material-Cycle Society



Legal framework for establishing a SMC society

Basic Environment Law
Completely enforced in August 1994

Basic Environment Plan
Completely amended and announced in April 2012

Basic Act for Establishing a SMC Society (Basic Framework Act)
Completely enforced in January 2001

- Ensuring material cycle in society
- Reducing consumption of natural resources
- Lowering environmental load

Fundamental Plan for Establishing a SMC Society
The fundamentals for other plans designed by the State
Officially announced in March 2003
Amended in March 2008

< Proper treatment of waste >

Waste Management and Public Cleansing Law
Partially amended in May 2010

①Reduction of waste generation
②Proper treatment of waste (including recycling)
③Regulation for establishment of waste treatment facilities
④Regulation for waste treatment operators
⑤Establishment of waste treatment standards, etc.

< Promotion of recycling >

Law for the Promotion of Effective Utilization of Resources
Completely amended and enforced in April 2001

①Recycling of recycled resources
②Ingenuity and innovation to create structures and use materials to facilitate recycling
③Labeling for sorted collection
④Promotion of effective utilization of by-products

reduce
recycle → reuse
recycle
（１Ｒ） （３Ｒ）

Regulations according to characteristics of individual articles

Law for the Promotion of Sorted Collection and Recycling of Containers and Packaging

Completely enforced in April 2000
Partially amended in June 2006

Bottles, PET bottles, paper or plastic containers and packages

Law for the Recycling of Specified Kinds of Home Appliances

Completely enforced in April 2001

Air conditioners, refrigerators, freezers, TVs, washing machines, drying machines

Law for the promotion of the Utilization of Recyclable Food Resources

Completely enforced in May 2001
Partially amended in June2007

Food residues

Construction Material Recycling Law

Completely enforced in May 2002

Timber, concrete, asphalt

Law for the Recycling of End-of-Life Vehicles

Completely enforced in January 2005

Vehicles

Small Home Appliance Recycling Law

Enforced in April 2013

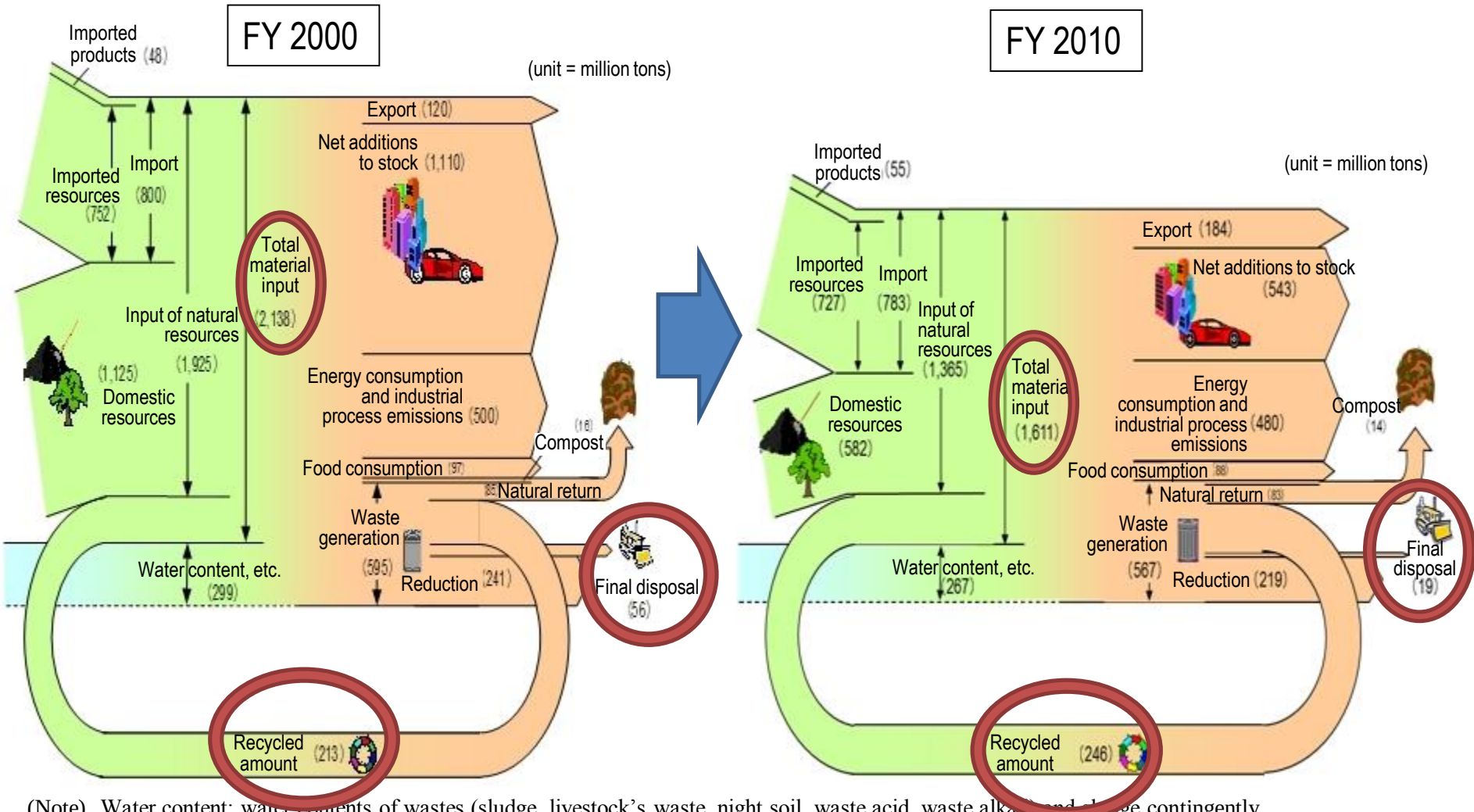
WEEE

Green Purchasing Law (The State takes the initiative to promote the procurement of recycled items)
Completely enforced in April 2001

Overview of the specific recycling laws

	Objective products	Efforts	Results
Act for Promotion of Sorted Collection and Recycling of Containers and Packaging (Enacted in June 1995) (Revised in June 2006)	- Steel cans, aluminum cans, glass bottles - Cardboards, cartons, paper containers and packages - PET bottles, plastic containers, plastic packages	Legal obligations; (1) Consumers sort and take out the waste (2) Local authority collects classified waste (3) Business entities are required to recycle materials	Separated collection rate of waste by local authorities in FY 2011 - 90% or more for cans, bottles and PET bottles - Approx. 80% for cartons - Approx. 70% for plastic containers - Approx. 40% for paper containers and packages
Home Appliance Recycling Act (Enacted in June 1998)	- Air conditioner - TV sets - Refrigerator, freezer - Clothes washing machine, clothes dryer	Manufacturers are obliged to collect and recommercialize their products, and retailers are obliged to collect and deliver their used products.	Recommercialized ratio: Air conditioner 89%, CRT-based TV sets79%, LCD and plasma TV sets 83%, refrigerator and freezer 79%, washing machine and dryer for clothes 87% (FY 2011)
Law for the Promotion of the construction material recycling (Enacted in May 2000)	- Concrete - Construction materials made of concrete and iron - Wooden material - Asphalt concrete block	Contractors, when earning a construction work contract of a certain level or larger, are obliged to classify and recycle construction materials on site.	Recycle ratio: Asphalt concrete block 98.4%, concrete block 97.3%, wooden materials from construction 89.4% (FY 2008)
Law for the Promotion of Utilization of Recyclable Food Resources (Enacted in June 2000) (Revised in June 2007	Food waste discharged from food-related business operators, including food production, distribution and restaurant industries	Food-related business operators are required to make an effort to achieve the goal in regard to the recycling and utilization of food resources	Recycle ratio: Food manufacturing industry 94%, food wholesaler 53%, food retailer 37%, restaurant industry 17% (FY 2010)
End-of-Life Vehicle Recycling Law (Enacted in July 2002)	Automotive shredder residues (ASR), airbags, CFC, etc. which were included in end-of-life cars. (* Iron scraps are exempt from recycling because of being valuable in the market.)	Automotive manufacturers are obligated to collect and recycle crushed residue from end-of-life cars	Recycle ratio by automotive manufacturers: Shredder dust 92-94%, airbags 92-100% (FY 2011)
Small Electrical and Electronic Equipment Recycling Act (Enacted in August 2012)	Small electrical and electronic appliances (* The items in this category are specified by the ordinances.)	Local authorities collect classified waste and business operators promote recycling	—
Act on the Promotion of Effective Utilization of Resources (Enacted in June 2000)	- PC - Small-sized rechargeable battery (sealed type)	By providing the system of designating certain kinds of trades and products, manufactures hereof are promoted to recover and recycle the material on their own initiative.	Recycle ratio: Desktop PC 76.6%, notebook PC 57.2% Recycling of the small-sized rechargeable batteries: nickel cadmium battery 72.8%, nickel hydrogen battery 76.6% (FY 2011)

Material flow in Japan

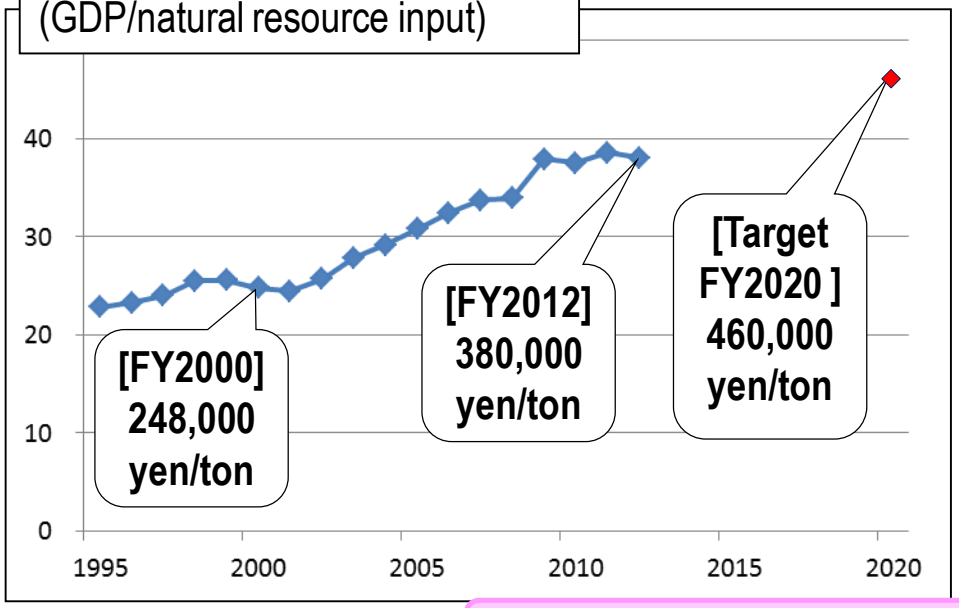


(Note) Water content: water contents of wastes (sludge, livestock's waste, night soil, waste acid, waste alka[illegible] and sludge contingently dumped in the process of economic activities (sludge in mining, construction and in waterworks as well as slag)

Japan's progress towards establishing a SMC society
– changes in major indexes and goals targeted by the 3rd Fundamental Plan –

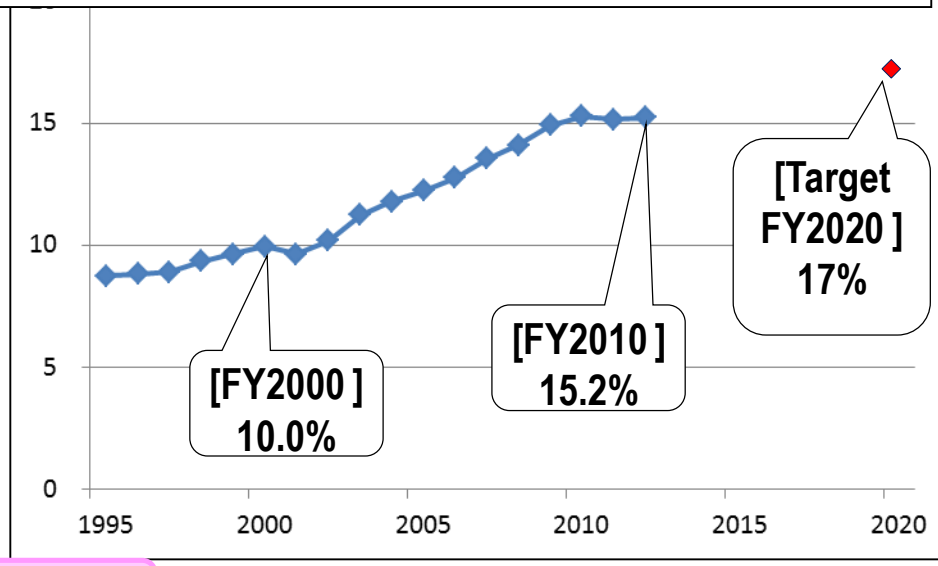
Resource productivity

(GDP/natural resource input)

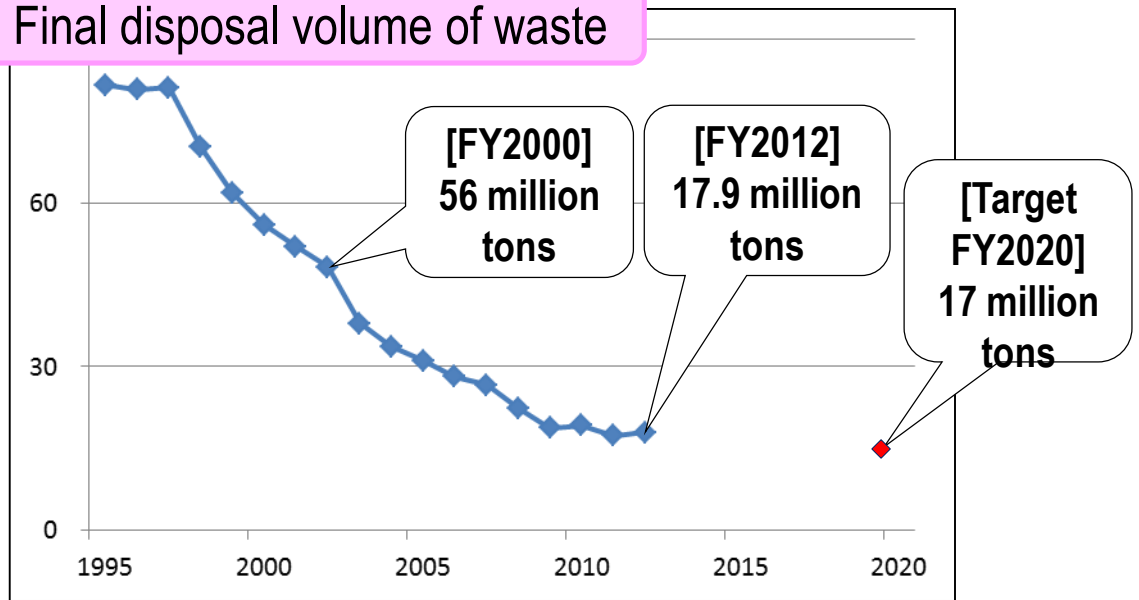


Recycling rate

cyclical use / (natural resource input + cyclical use)



Final disposal volume of waste



Key points of the Third Fundamental Plan for a Sound Material-Cycle Society (formulated by the cabinet in May 31, 2013)

Formation of a Sound Material-Cycle Society, focusing on its quality

- 2R (Reduce, Reuse) promotion
- Recovery of useful metals from consumed products and promotion of a high grade recycle
- Conversion of recycle and biomass resources into energy
- Development of the efforts integrating the elements for a low carbon society and a nature-harmonized society, and grade-up of the local recycling network

Promotion of global efforts

- A global sound material-cycle society through Regional 3R Forum in Asia and the Pacific
- Technology transfer

Response to the Great East Japan Earthquake

- Effective treatment and reuse of disaster waste
- Safe treatment of waste contaminated by radioactive substances

3. Japan’s International Cooperation to Promote 3R

Japan's 3R Initiatives: international cooperation to promote 3R

- ☑Advance sharing of information and consensus-building through the Regional 3R Forum in Asia, in order to facilitate formation of sound material-cycle society in the Asian countries.
- ☑Provide support for formulation of national 3R strategies, legal development, dispatch of experts, and acceptance of trainees in order to enable the establishment of waste and recycling systems in Asia.
- ☑ Provide support for Japanese technology transfer of waste management and recycling industry.
- ☑ Participate in the initiatives of UNEP and other international organizations, and apply the latest knowledge regarding 3R and waste management.

In Tokyo , April 2005

Inaugural Meeting of the Regional 3R Forum in Asia in November 2009 at Meguro Gajoen, Tokyo

- Waste & Recycling
  http://www.env.go.jp/en/recycle/index.html

- Regional 3R Forum in Asia and the Pacific
  http://www.env.go.jp/recycle/3r/en/index.html

- Japan's Waste Management and Recycling Technologies and Businesses
  http://www.env.go.jp/recycle/circul/venous_industry/index_en.html

THANK YOU !!!

Masahito Fukami