Japanese Initiative toward a Sound Material-Cycle Society

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1. Waste Management and Recycling in Japan

- Administrative organization for waste management
- Waste classification
- Present State of waste treatment and disposal

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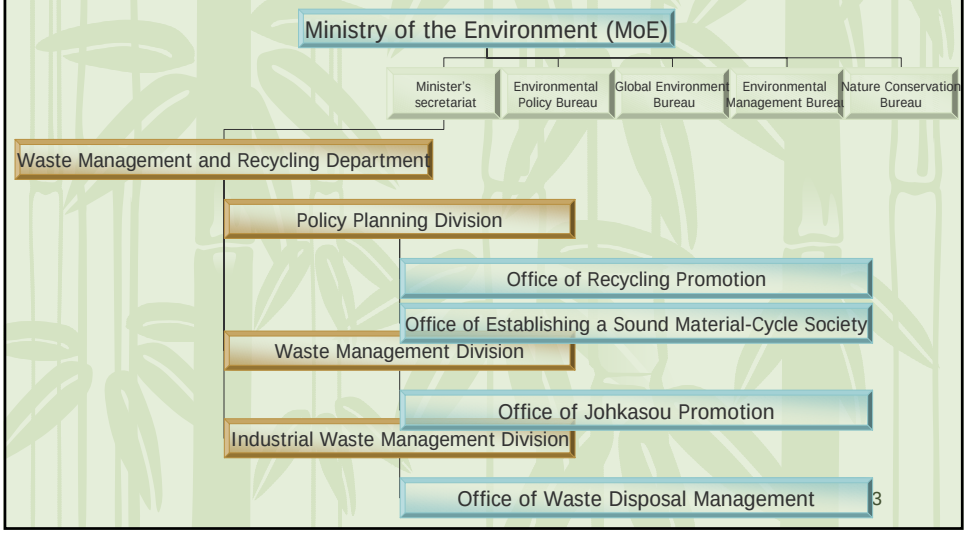
Administrative organization for waste management



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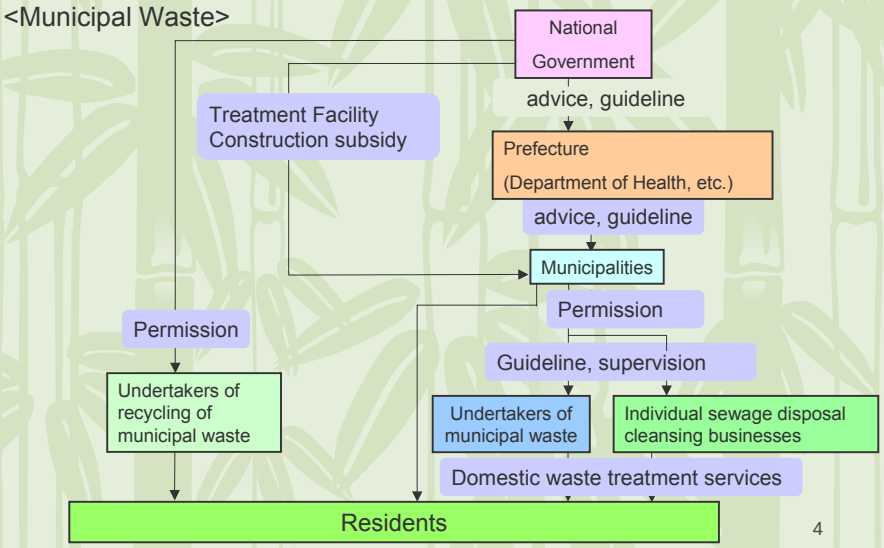
Administrative organization for waste management



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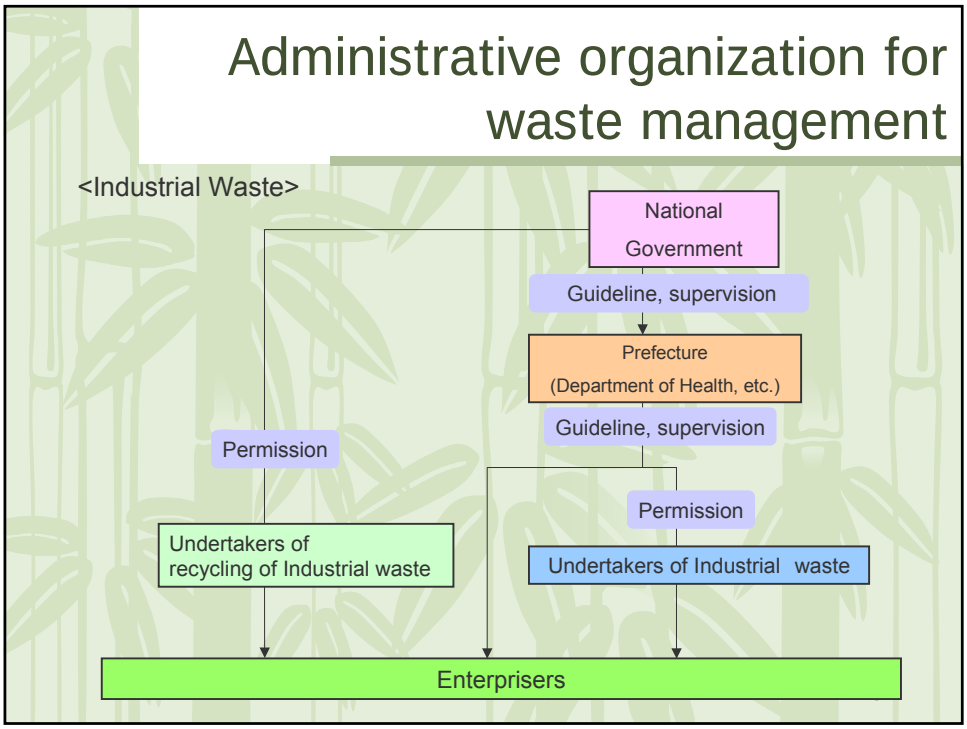
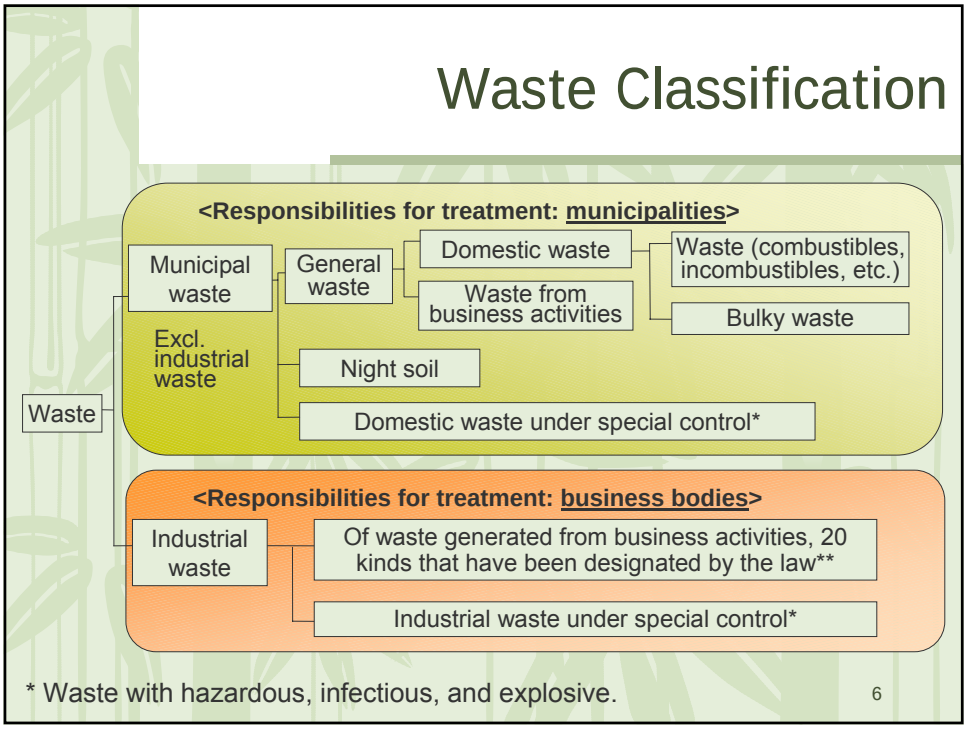
Administrative organization for waste management



Waste Classification



* Waste with hazardous, infectious, and explosive.

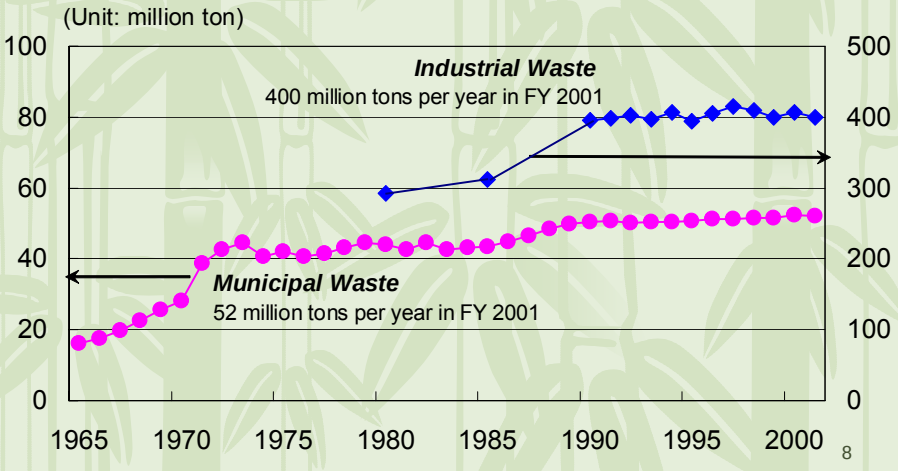
Waste Classification

<industrial waste>

1. combustion residue
2. sludge
3. waste oil
4. waste acid
5. waste alkali
6. waste plastics
7. waste papers*
8. wood chips*
9. waste textiles*
10. animal and plant residues*
11. animal residue from slaughterhouses*
12. waste rubber
13. scrap metal
14. waste glass and ceramics
15. slag
16. construction and demolition waste
17. animal excretions*
18. animal carcass*
19. dust*
20. waste generated from industrial waste treatment

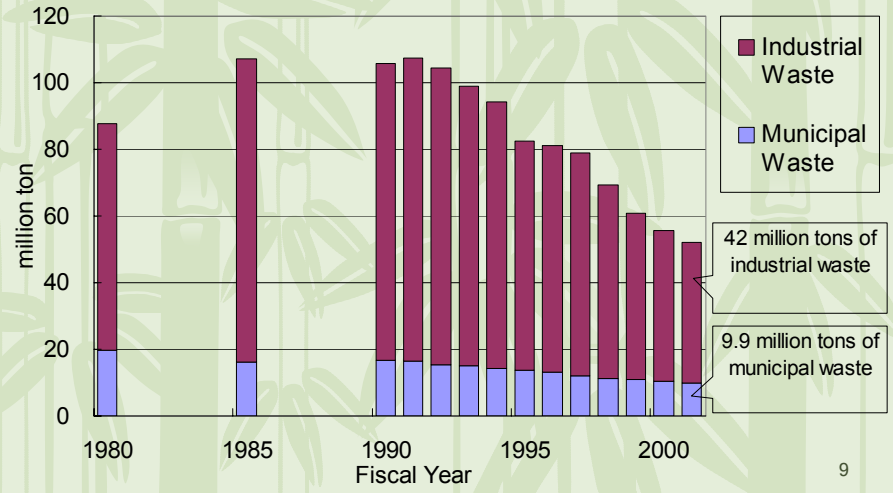
Present state of waste treatment and disposal

Change in waste discharge



Present state of waste treatment and disposal

Change in waste discharge



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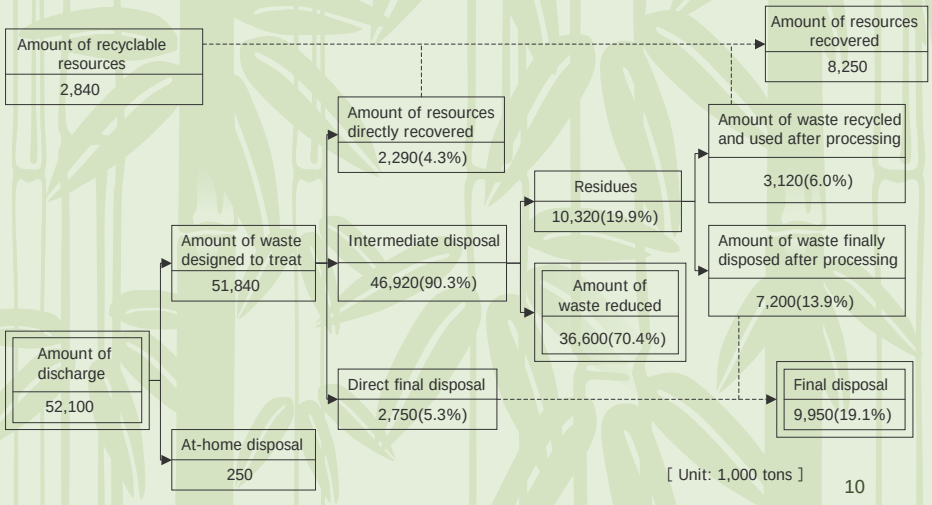
Present state of waste treatment and disposal

Flow diagram of municipal waste (MSW) in FY2001



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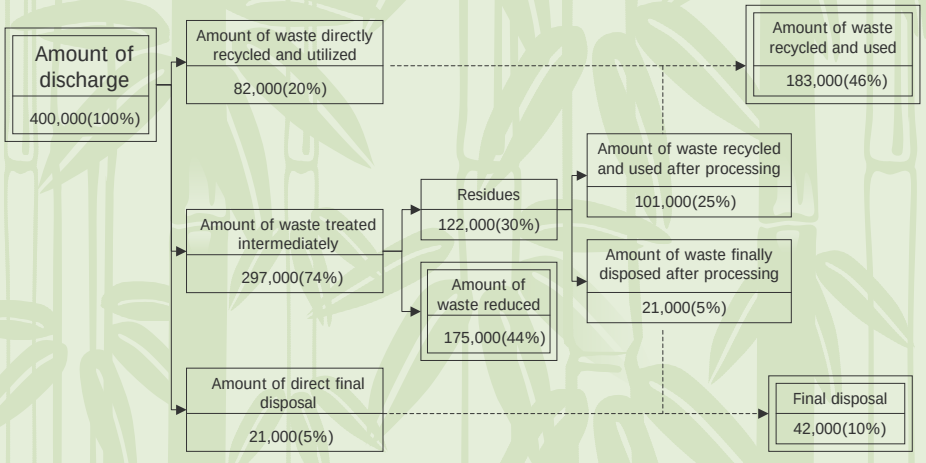
Present state of waste treatment and disposal

Flow diagram of industrial waste (ISW) in FY2001



[Unit: 1,000 tons]

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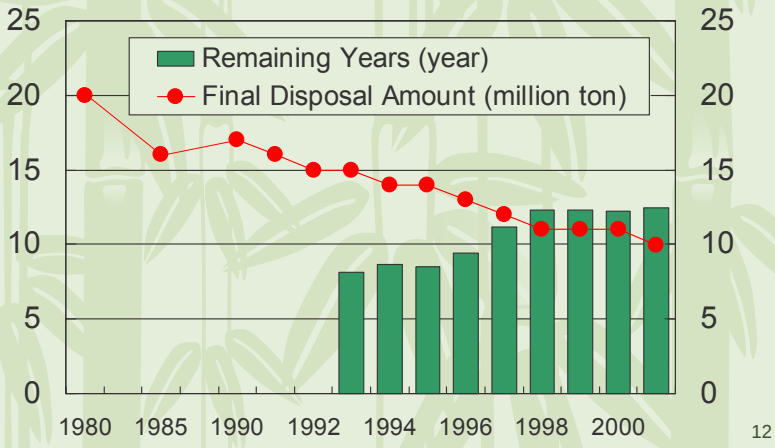
Present state of waste treatment and disposal

Remaining years of final disposal sites and final disposal amount (municipal waste)



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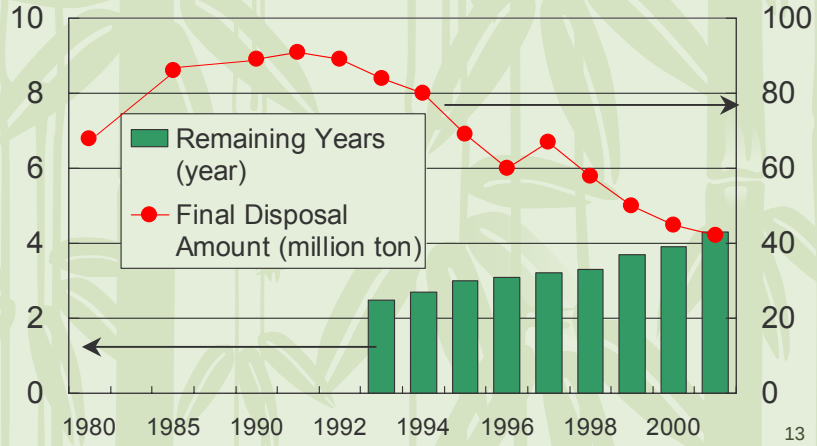
Present state of waste treatment and disposal

Remaining years of final disposal sites and final disposal amount (industrial waste)



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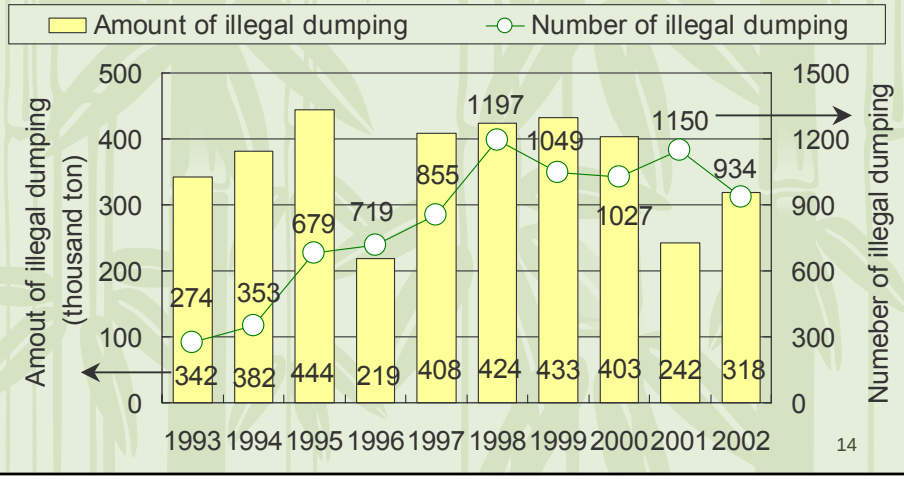
Present state of waste treatment and disposal

Illegal dumping of industrial waste



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2. What's a "Sound Material-Cycle Society"

A SOUND MATERIAL-CYCLE SOCIETY means:

A society in which the consumption of natural resources is minimized and the environmental load is reduced as much as possible.

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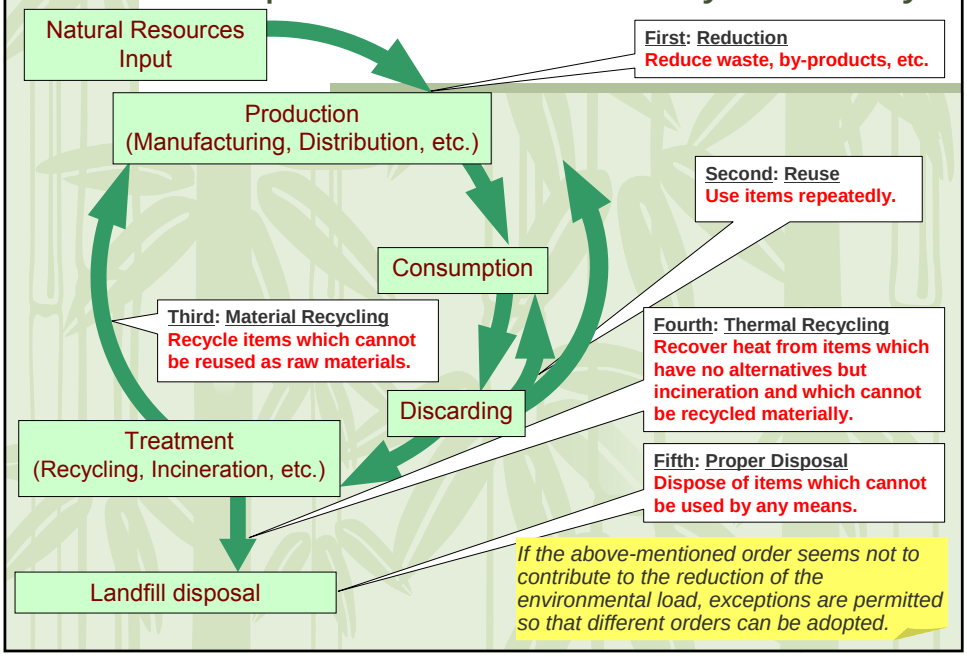
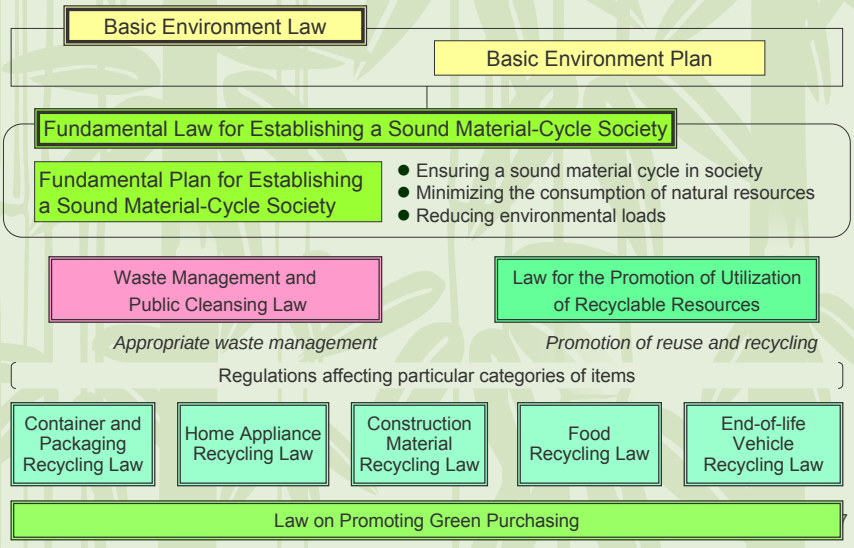
Concept of "Sound Material-Cycle Society"



3. Legislative Framework to Establish a Sound Material-Cycle Society



Fundamental Law for Establishing a Sound Material-Cycle Society

Purposes of the Law

- Set forth the fundamental policies which facilitate a sound material-cycle society
- Articulate the basic principles underlying such a society
- Clarify the responsibilities of stakeholders
- Establish a Basic Plan

Basic principles

- Realize a society in which sustainable development is possible with less environmental impact
- Prioritize the ways of handling products, waste and recyclables
- Ensure the appropriate material cycle in nature

National government | Citizens | NGOs and NPOs | Business organizations | Local governments

Fundamental Plan for Establishing a Sound Material-Cycle Society

Key features

- Establishing waste management facilities
- Education
- Facilitating of activities of non-governmental organizations
- Research and development
- International collaboration
- Reductions in the generation of waste
- Reductions in the generation of waste
- Appropriate recycling and waste disposal
- Encouragement of the use of recycled products and materials
- Assessment of products and packaging with regard to the “3Rs”
- Implementation of economic measures such as taxes and levies

Follow-up on Johannesburg Plan of Implementation (JPOI)

Paragraph 15. Encourage and promote the development of a 10-year framework of programmes in support of regional and national initiatives to accelerate the shift towards sustainable consumption and production… delinking economic growth and environmental degradation….

All countries should take action, with developed countries taking the lead….

In March 2003

In line with the JPOI, the Government of Japan established *"The Basic Plan for Establishing a Sound Material-Cycle Society"* as a 10-year framework of programmes.

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Outline of the Fundamental Plan

Present Situation and Problem

Present Situation: Unsustainable behavior patterns of the 20th century
Tasks: Realization of Socio-Economic Systems Based on 3R
Resolution of Waste-related Problems

Image of Sound-Material Cycle Society

Lifestyle: Use of high-quality goods with care; adoption of "slow-paced" lifestyle
Manufacturing: DfE (Design for Environment), long-life products, lease & rental

Quantitative Targets: FY2000-2010

1. Targets for Indicators Based on Material Flow Accounts
   a) Input: Resource Productivity
   b) Cycle: Cyclical Use Rate
   c) Output: Final Disposal Amount
2. Targets for Indices related to Efforts
   - Reducing the quantity of municipal solid waste
   - Expanding the market size and the extent of employment generated

Efforts of Stakeholders

National Government, Citizens, Business Organizations, NPOs/NGOs, Local Governments


Waste management and public Cleansing Law
Municipal solid waste
Industrial waste
Governor of Municipalities
Governors of Prefectures
Municipalities
Responsibility for Treatment
• shall specified a "municipal solid waste management plan" in their respective administrative areas
• shall collect, transport and dispose municipal solid waste according to the plan before they interfere with the conservation of the living environment
Discharging Agencies
Responsibility for Treatment
• shall treat ISW themselves
• shall observe storage standard until carriage
• shall observe treatment standard
• be responsible concerning commission
• shall observe commission standard
MSW Treatment Bodies
• shall receive permission each district
• shall observe treatment standard
• be banned to re-commission
• be banned to name-lending
ISW Treatment Bodies
• shall receive permission each district
• shall observe treatment standard
• be banned to re-commission in principle
• be banned to name-lending
MSW Facility-Setting Bodies
• shall receive permission for
•establishment and handover
ISW Facility-Setting Bodies
• shall receive permission for
•establishment and handover
A B C D
A B C
A: permission, B: collection of reports, C: commission for improvement, D: commission for measure
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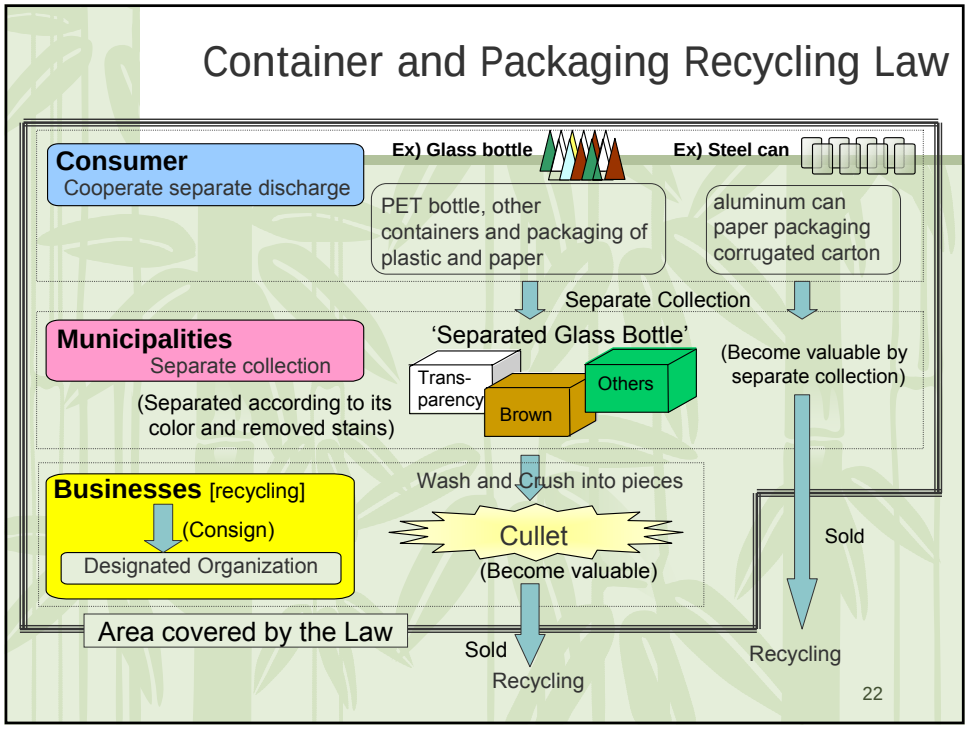
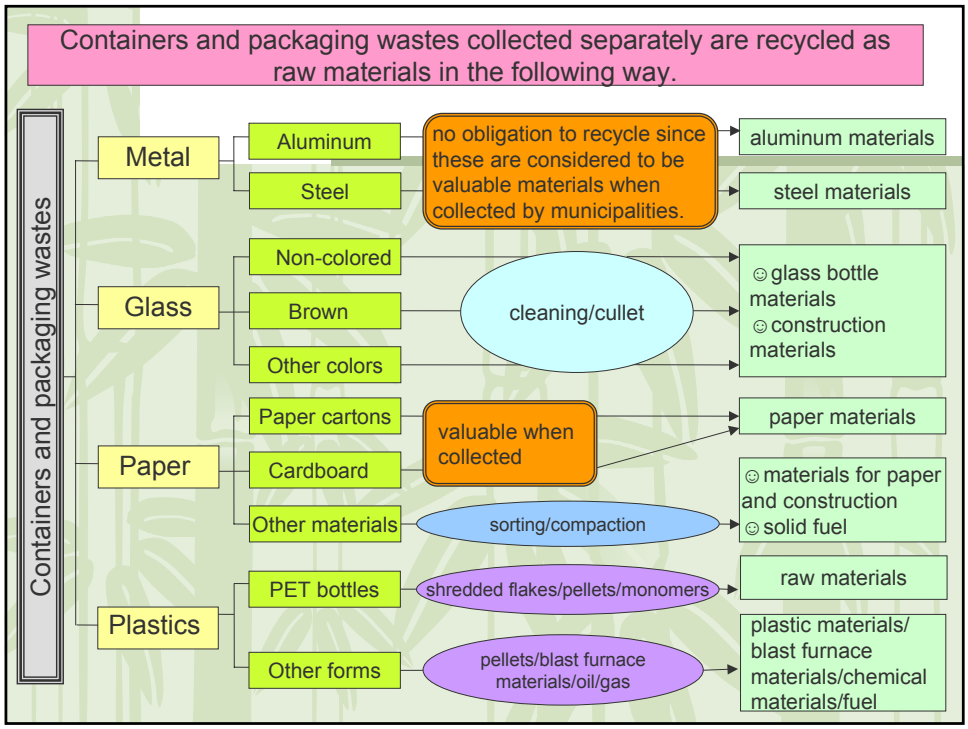
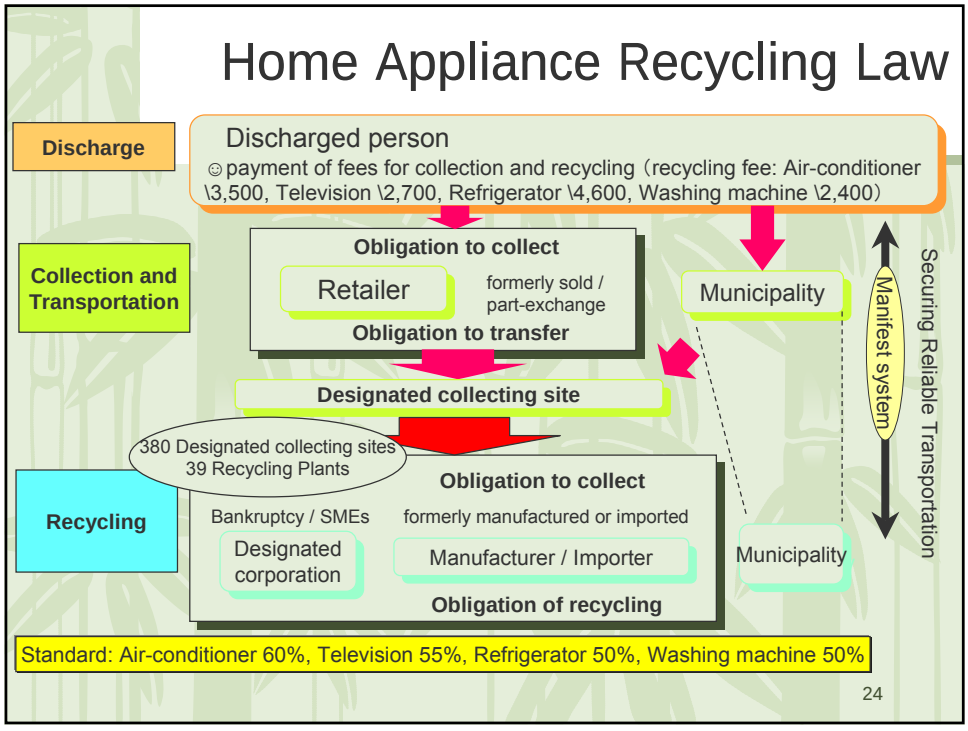

Container and Packaging Recycling Law
Consumer
Cooperate separate discharge
Ex) Glass bottle
Ex) Steel can
PET bottle, other containers and packaging of plastic and paper
aluminum can paper packaging corrugated carton
Separate Collection
Municipalities
Separate collection
(Separated according to its color and removed stains)
'Separated Glass Bottle'
Trans-parency
Brown
Others
(Become valuable by separate collection)
Businesses [recycling]
(Consign)
Designated Organization
Wash and Crush into pieces
Cullet
(Become valuable)
Sold
Recycling
Area covered by the Law
Sold
Recycling
22


Containers and packaging wastes collected separately are recycled as raw materials in the following way.
Containers and packaging wastes
Metal
Aluminum
Steel
no obligation to recycle since these are considered to be valuable materials when collected by municipalities.
aluminum materials
steel materials
Glass
Non-colored
Brown
Other colors
cleaning/cullet
☺glass bottle materials
☺construction materials
Paper
Paper cartons
Cardboard
Other materials
valuable when collected
sorting/compaction
paper materials
☺materials for paper and construction
☺solid fuel
Plastics
PET bottles
Other forms
shredded flakes/pellets/monomers
pellets/blast furnace materials/oil/gas
raw materials
plastic materials/ blast furnace materials/chemical materials/fuel


Home Appliance Recycling Law
Discharge
Discharged person
☺payment of fees for collection and recycling（recycling fee: Air-conditioner \3,500, Television \2,700, Refrigerator \4,600, Washing machine \2,400）
Collection and Transportation
Obligation to collect
Retailer
formerly sold / part-exchange
Obligation to transfer
Municipality
Manifest system
Securing Reliable Transportation
Designated collecting site
380 Designated collecting sites
39 Recycling Plants
Recycling
Obligation to collect
Bankruptcy / SMEs
formerly manufactured or imported
Designated corporation
Manufacturer / Importer
Municipality
Obligation of recycling
Standard: Air-conditioner 60%, Television 55%, Refrigerator 50%, Washing machine 50%
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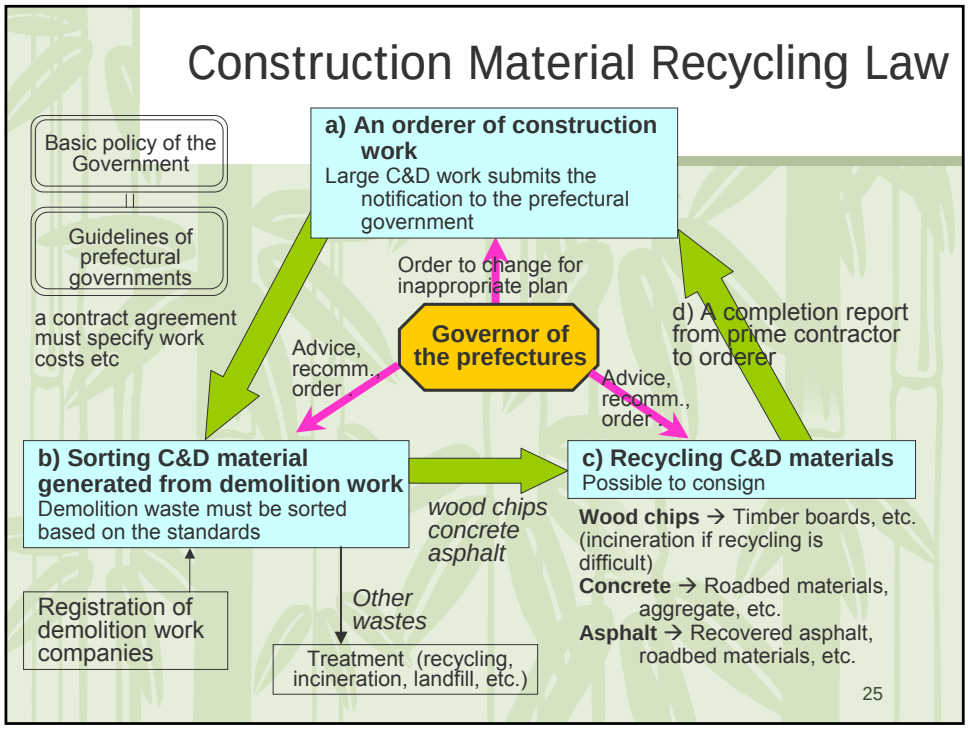
Construction Material Recycling Law
Basic policy of the Government
Guidelines of prefectural governments
a contract agreement must specify work costs etc
a) An orderer of construction work
Large C&D work submits the notification to the prefectural government
Order to change for inappropriate plan
Governor of the prefectures
Advice, recomm., order
Advice, recomm., order
d) A completion report from prime contractor to orderer
b) Sorting C&D material generated from demolition work
Demolition waste must be sorted based on the standards
wood chips
concrete
asphalt
c) Recycling C&D materials
Possible to consign
Wood chips → Timber boards, etc. (incineration if recycling is difficult)
Concrete → Roadbed materials, aggregate, etc.
Asphalt → Recovered asphalt, roadbed materials, etc.
Registration of demolition work companies
Other wastes
Treatment (recycling, incineration, landfill, etc.)
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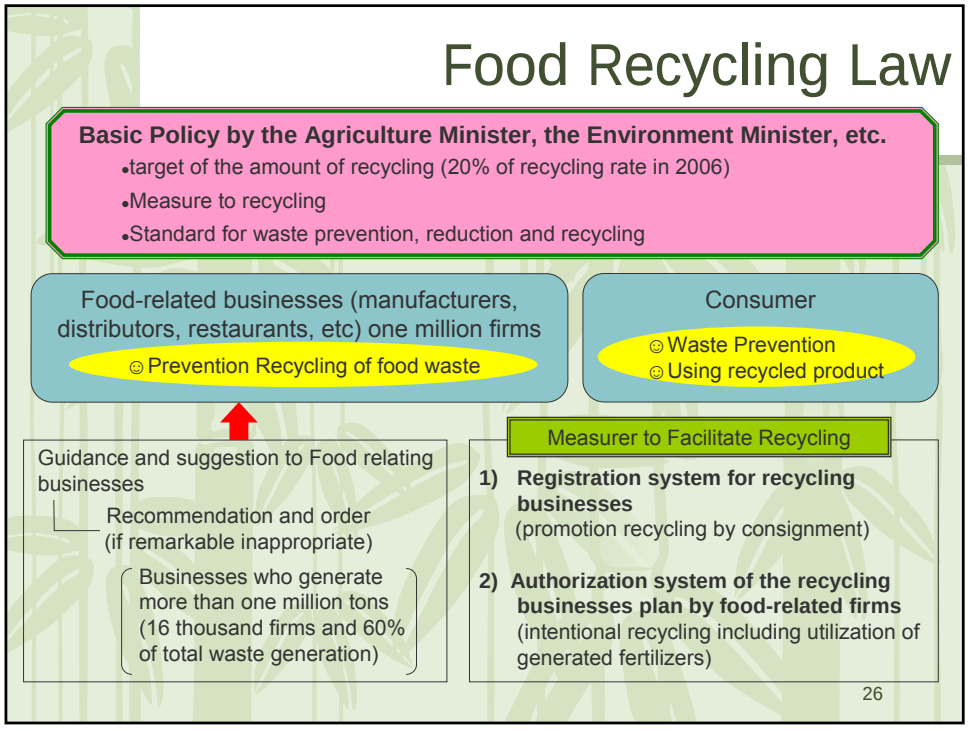
Food Recycling Law
Basic Policy by the Agriculture Minister, the Environment Minister, etc.
•target of the amount of recycling (20% of recycling rate in 2006)
•Measure to recycling
•Standard for waste prevention, reduction and recycling
Food-related businesses (manufacturers, distributors, restaurants, etc) one million firms
☺Prevention Recycling of food waste
Consumer
☺Waste Prevention
☺Using recycled product
Guidance and suggestion to Food relating businesses
Recommendation and order (if remarkable inappropriate)
Businesses who generate more than one million tons (16 thousand firms and 60% of total waste generation)
Measurer to Facilitate Recycling
1) Registration system for recycling businesses (promotion recycling by consignment)
2) Authorization system of the recycling businesses plan by food-related firms (intentional recycling including utilization of generated fertilizers)
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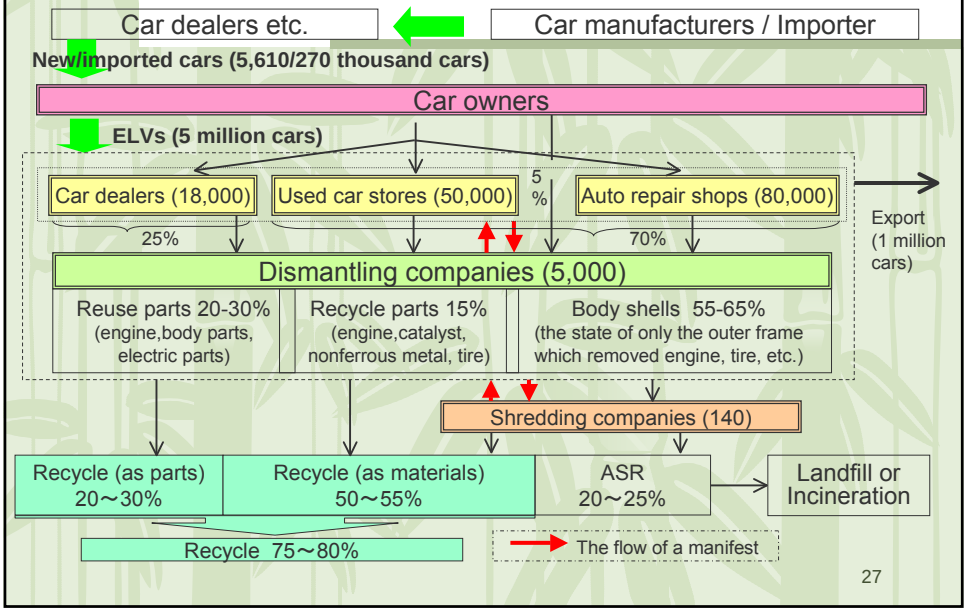
End-of-life Vehicle Recycling Law



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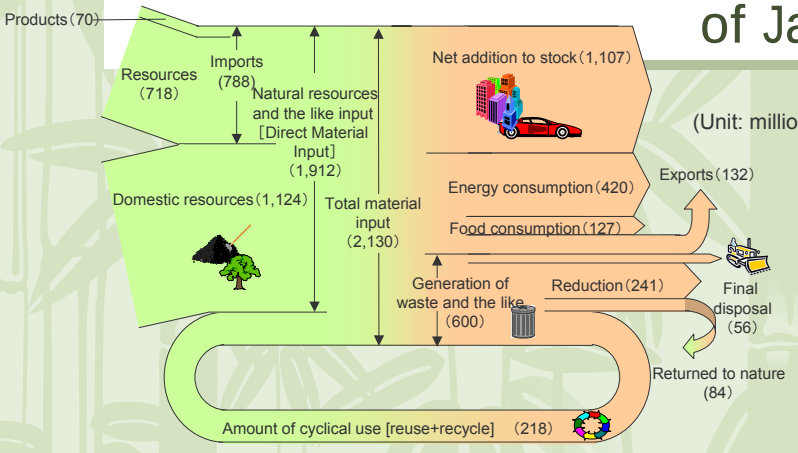
4.Material Flow Accounts (MFA) of Japan



(Unit: million ton)

The material flow accounts for FY2000 roughly show:

1) Total material input is about 2.1 billion tons
2) Amount of cyclical use (reuse + recycling) is 218 million tons
3) Amount of final disposal is 56 million tons

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5. Three Indicator Based on MFA

- Resource Productivity (input)
- Cyclical Use Rate (cycle)
- Final Disposal Amount (output)

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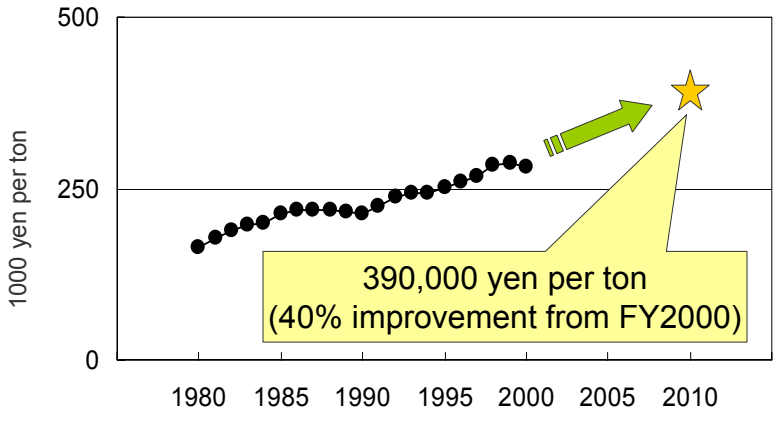
Input: Resource Productivity



$$\text{Resource Productivity} = \frac{\text{GDP}}{\text{DMI* (Input of natural resources and the like)}}$$

**DMI: Direct Material Input*

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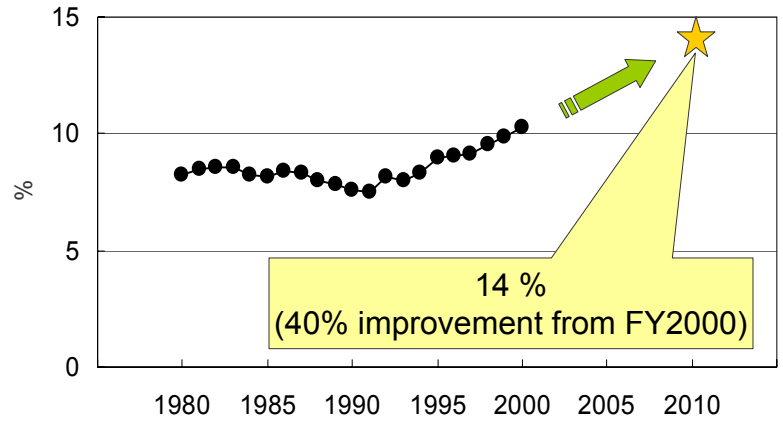
Cycle: cyclical use rate



Cyclical Use Rate = Amount of cyclical use (reuse + recycling) / DMI + Amount of cyclical use

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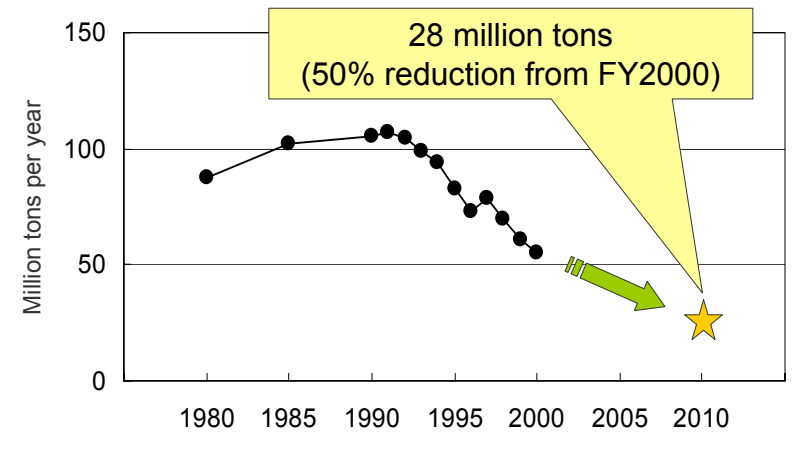
Output: Final Disposal Amount



Final Disposal Amount = Final disposal amount of waste

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Introduction

- The 2nd Basic Environment Plan(2000)
  - ☺→Set **Quantitative Targets** in Basic Plan for a Sound Material-Cycle Society in order **to grasp objectively the effect** of measures to establish it.
  - ☺←The 1st Basic Environment Plan lacked quantitative targets and its evaluation process suffered from the absence of objective reference.

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Choice of Indicators

From Language into Indicators

- Policy goals defined in natural language vs. quantitative Indicators

  Definition of Sound Material-Cycle Society
  - The consumption of natural resources and the environmental load will be restrained/reduced, by Reduce-Reuse-Recycle(3R) measures.

➔Need to translate into measurable indicators.

=Risk of arbitrariness

- Feedback(Ind.→policy goal) is also needed.

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Choice of Indicators
Conceptually better Indicators vs. Data gap

- TMR including hidden flows
- Material Use Time (How long material stays in the society.)
  - The length of time between input of material into the economy to output from the economy.

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Choice of Indicators
DMI(Direct Material Input) alone enough?

- Inflow is future outflow.
  - DMI is not only inflow indicator but also outflow indicator.
- But, should there be upper limit of material use ?
  - Scientific rationale?
  - Political processes?

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Choice of Indicators
Indicators at three sections of material flow

- DMI target is difficult to introduce.
- To see material flows in balanced view, indicators of inflow, outflow and cyclical flow have been adopted.

Not exact, but rough picture is…

- Inflow : Consumption of natural resources
- Outflow : Environmental load
- Cyclical flow : Reduce-Reuse-Recycle measures

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Choice of Indicators
Inflow: GDP/DMI (Resource Productivity)

- Resource=GDP x (Resource/GDP)
  - ☺Politically, GDP must grow.
  - ☺Then, the only way to reduce resource input is to reduce resource/GDP, or to increase GDP/resource.
    - →Decoupling indicator.
    - →Fits definition.
  - ☺The first indicator/target in Japan's environmental policy which includes monetary dimension.
    - →Relevant ministries have to have better understanding of GDP.

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Choice of Indicators

Inflow: GDP/DMI and Manufacturing abroad

- Does manufacturing abroad (or industry's moving abroad) improve GDP/DMI?
- No, not necessarily.
  - Because, importing goods manufactured abroad instead of manufacturing them domestically decreases not only DMI but also GDP.
  - Need to watch factors of GDP/DMI analytically.

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Choice of Indicators

Persistent question about MFA indicators: "Weights"?

- MFA counts materials' "weights".
- ←Economics says "prices"=scarcities. But,…
  - Price distortion.
  - Aversion to "monetary" term.
- ←LCA recommends "impact factors". But,…
  - How to synthesize different environmental problems.
- ←Use of sustainably-managed biomass should be encouraged.
  - Yes, but how to certify the sustainability?

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Choice of Indicators

Persistent question about MFA indicators: "Weights"?

- Finally, weighting all by "1".
  - Easy to understand.
  - Classification will help to show differences among different materials.
  - We have many other environmental indicators in other environmental policy areas.
  - But there are no indicators of quantity of material use in other environmental policy areas.

  Not substitute, but complement.

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Choice of Indicators

Outflow: Final Disposal Amount

- Urgent problem is the very limited remaining capacity of final disposal sites.
- Quantity to be disposed or to be landfilled. The latter. Incineration has been encouraged to reduce final disposal amount.
- Familiar indicator.

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Choice of Indicators
Cyclical flow: Cyclical Use Rate

- Theoretical measurement problem of the amount of cyclical use, similar to “length-of-coastline problem”.
  - Need to define rule of measurement, including trade of used goods/materials.
  - Differentiate between inside production recycling and consumption-production recycling? No, according to tradition.
- Practical data gaps of the amount of cyclical use.
  - e.g. Heat recovery. ……Costs?
    - →Again, need of measurement rule

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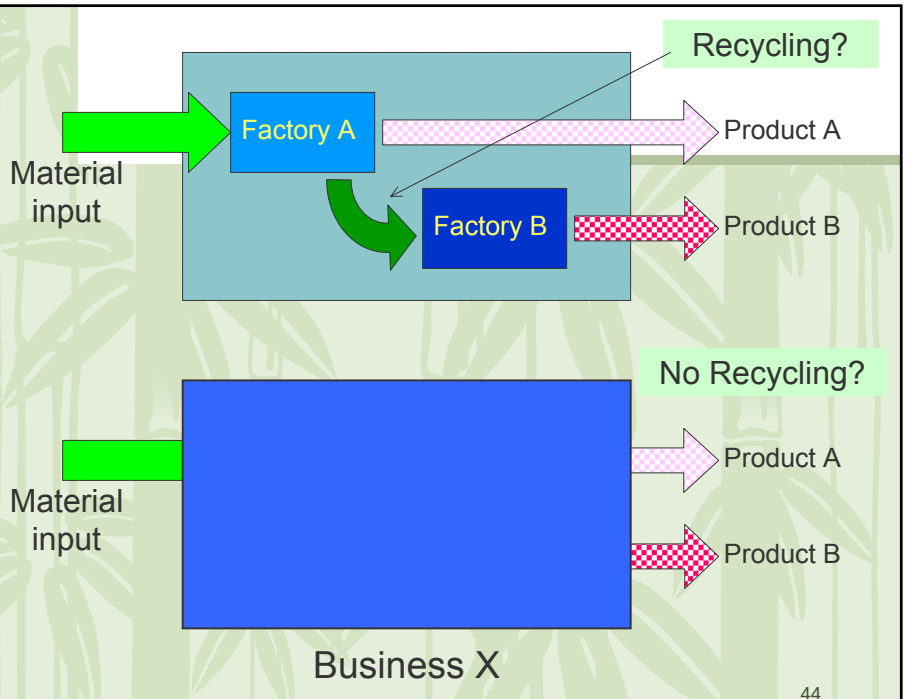

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Choice of Indicators

Cyclical flow: Cyclical Use Rate: Against What?

- Which rate? Cyclical use amount …
  - over outflow amount (waste generated) ?
  - over inflow amount (DMI + cyclical use) ?
  - ➔The latter. As the former might send message "it is OK to generate any large amount of waste, as long as you use them cyclically", which is against hierarchy of waste management adopted in the Basic law for SMCS.

Reduce > Reuse > Recycle

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6. Indices Related to Efforts

- Changing in thoughts and actions to establishing a Sound Material-Cycle Society
- Reducing the quantity of waste and the likes
- Promoting businesses relating a Sound Material-Cycle Society

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Changing in thoughts and actions

In the year 2010 …

- about 90 percent of respondents should have an intention of reducing the quantity of waste, cyclical use, and green purchasing,
- and 50 percent should take concrete actions as to these matters.

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Reducing the quantity of waste and the likes

In the year 2010 …

1) Reducing the quantity of municipal solid waste
   - 20% reduction of the amount of garbage discharged from households per person per day and from offices per day (compare to 2000)

2) Reducing the quantity of industrial waste
   - 75% reduction of the final disposal amount of industrial waste (compare to 1990)

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Promoting businesses relating a Sound Material-Cycle Society

In the year 2010 …

1) Promoting green purchasing
   - 50 percent of all the local governments and companies listed in Stock Exchanges, and about 30 percent of the unlisted companies (with 500 employees or more) surveyed, will implement organization-wide green purchasing.

2) Promoting environmental business management
   - 50 percent of the listed companies and about 30 percent of the unlisted companies surveyed will publish an environmental report and conduct environmental accounting

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7. Activities by governments, citizens, NGOs/NPOs, and private firms

- Measures to Be Taken
- Green Procurement
- Environmental Report
- Material flows and target setting

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Measures by national government

- Secure material cycle in nature
- Change lifestyle [Re-style]
- Promoting businesses relating a Sound Material-Cycle Society
- Realize Safe and secure treatment and disposal of waste
- Establish the basis for supporting a Sound Material-Cycle Society

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Measures by citizens

- refraining from using disposable products
- refusing excessive packaging and promoting simple packaging, using “eco-bags”
- selecting green products and services that impose smaller environmental loads (recycled products and refillable products, and rental and leasing services)
- cooperate in sorting collected waste to reduce its quantity and recycling
- participate or cooperate in environmental education, environmental learning, and activities for environmental preservation

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Measures by NGOs/NPOs

- activities for preserving the environment of local areas, such as the promotion of the 3Rs, and assistance for local residents to change their lifestyles
- environmental education, environmental learning and enlightenment activities to promote actions by citizens and businesses for establishing a sound material-cycle society
- sustainable and expandable activities as community businesses

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Measures by private firms

- restrict the production and distribution of disposable products and packaging
- extend the life of products, use materials, products and services with environmental loads
- take back products no longer used
- as for products, reduce environmental loads at various stages, including resource extraction, production, distribution, consumption and disposal, through life cycle assessment (LCA)
- diffuse green products and services
- provide consumers with information through environmental labeling
- disclose and provide information through the publication of environmental reports

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Measures by local governments

- make efforts in community making, including sorted collection and appropriate management of waste, promotion of 3Rs, and improvement of waste treatment facilities
- cooperate with business and private organizations, including NPOs and NGOs, to assist local residents to change their lifestyles (as a coordinator and main animator of the efforts of the community)
- recommend environment conscious green products and services or products made in the local area
- take the initiative in green purchasing, implementation of an environment management system (as a business organization)
- formulate the fundamental plan to promote the establishment of a SMCS in the local area

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Law on promoting green purchasing (1)

Objectives

- **Promoting Greener Purchasing by Public Organizations**
- **Providing Information on Eco-friendly Goods and Services**

Establishing Environmentally Sound and Sustainable Society

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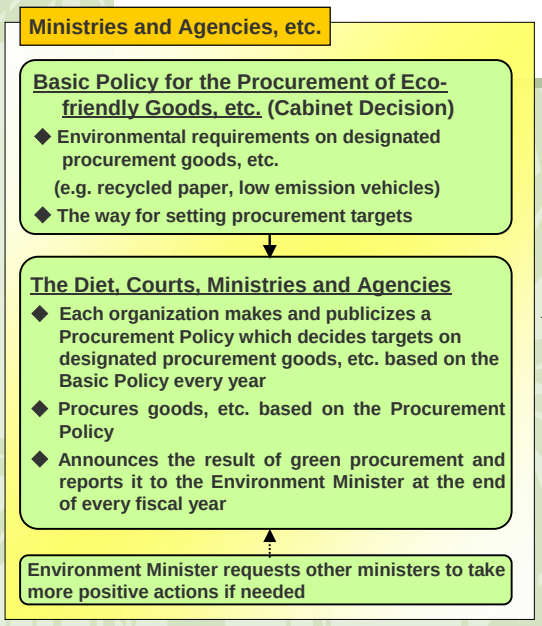
Law on promoting green purchasing (2)



Law on promoting green purchasing (3)

Providing Appropriate Information on Eco-friendly Goods, etc.

Manufacturers, importers, etc.
should provide environmental information on their products.

Ecolabeling bodies, etc.
should promote ecolabeling programs on scientific basis and in complying with international standards.

The Government
considers appropriate information providing systems on eco-friendly goods, etc.

Procurement Achievements of Eco-Friendly Goods (FY 2001)

- **Designated procurement items:** 14 categories, 101 items
- **Categories:** Papers, Stationary, Office Furniture, Office Machines, Consumer Electronics and Electrical Appliances, Lighting, Automobiles, Uniforms and Work Clothes, Interior Fixtures, Work Gloves, Facilities, Public Works, Services

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Procurement Ratio of Eco-Friendly Goods is around 90% in most of the items

Ex1. Copier Paper (100% recycled paper content and no more than approximately 70% bleaching): 92.6%

$$\frac{\text{Designated procurement goods (179,860t)}}{\text{Domestic total shipment (762,118t)}} = 23.6\%$$

Ex2. Ball-point pens (Recycled plastic makes up no less than 40% in weight): 94.9%

$$\frac{\text{Designated procurement goods (71,835,000 units)}}{\text{Domestic total shipment (457,548,000 units)}} = 15.7\%$$

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Law for the Promotion of Environmentally Sound Management by Providing Environmental Information

	National government	Local government	Large companies	Organizations related to the government*
Providing and publishing the annual report of environment	Obliging	Provision for effort	Provision for effort	Obliging

☺Obligation of the national government
☺Providing the entries for the report of environment
☺Offer the information to declare the situations of medium and small enterprises
☺taking measures to set forward uses of environmental information

☺Following the entries
☺Doing a self-evaluation or evaluation by a third party.

Evaluation the effort by society or market

*Independent corporations of government etc.

❖Satisfaction of the unifying the environment with the economy

❖Announce Japan's effort to the world

❖Taking the leadership of the world to save our environment

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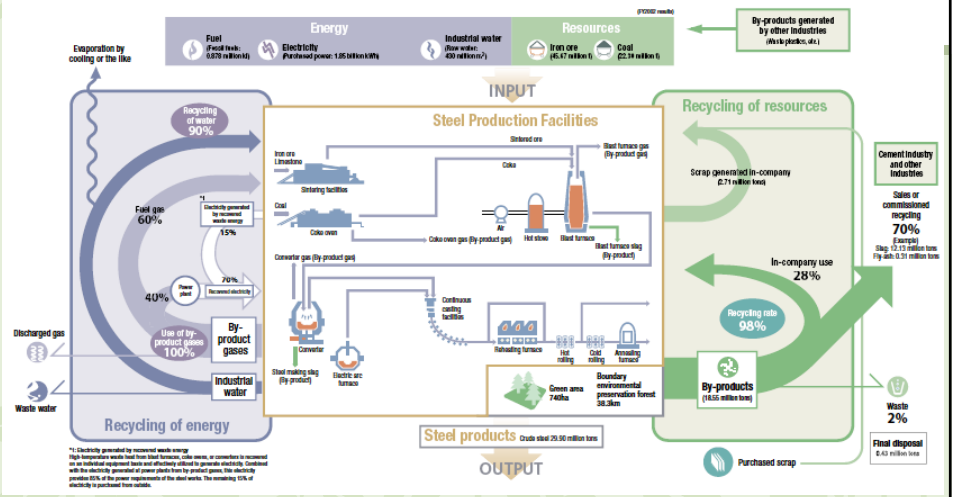
Ex.1) Nippon Steel Environmental Report



http://www0.nsc.co.jp/shinnihon_english/kankyou/index.html

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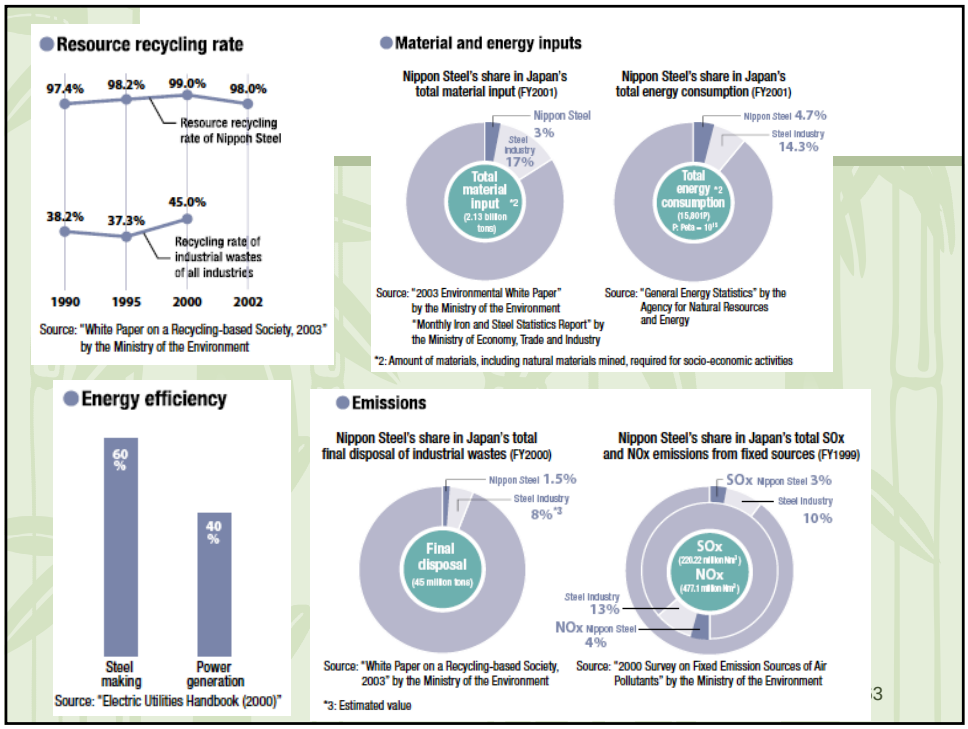
Resource recycling rate
97.4%
98.2%
99.0%
98.0%
Resource recycling rate of Nippon Steel
38.2%
37.3%
45.0%
Recycling rate of industrial wastes of all industries
1990
1995
2000
2002
Source: "White Paper on a Recycling-based Society, 2003" by the Ministry of the Environment
Material and energy inputs
Nippon Steel's share in Japan's total material input (FY2001)
Nippon Steel 3%
Steel industry 17%
Total material input *2 (2.13 billion tons)
Nippon Steel's share in Japan's total energy consumption (FY2001)
Nippon Steel 4.7%
Steel industry 14.3%
Total energy *2 consumption
Source: "2003 Environmental White Paper" by the Ministry of the Environment
*Monthly Iron and Steel Statistics Report" by the Ministry of Economy, Trade and Industry
Source: "General Energy Statistics" by the Agency for Natural Resources and Energy
*2: Amount of materials, including natural materials mined, required for socio-economic activities
Energy efficiency
60 %
40 %
Steel making
Power generation
Source: "Electric Utilities Handbook (2000)"
Emissions
Nippon Steel's share in Japan's total final disposal of industrial wastes (FY2000)
Nippon Steel 1.5%
Steel industry 8%*3
Final disposal (45 million tons)
Nippon Steel's share in Japan's total SOx and NOx emissions from fixed sources (FY1999)
SOx Nippon Steel 3%
Steel industry 10%
SOx
NOx
Steel industry 13%
NOx Nippon Steel 4%
Source: "White Paper on a Recycling-based Society, 2003" by the Ministry of the Environment
Source: "2000 Survey on Fixed Emission Sources of Air Pollutants" by the Ministry of the Environment
*3: Estimated value
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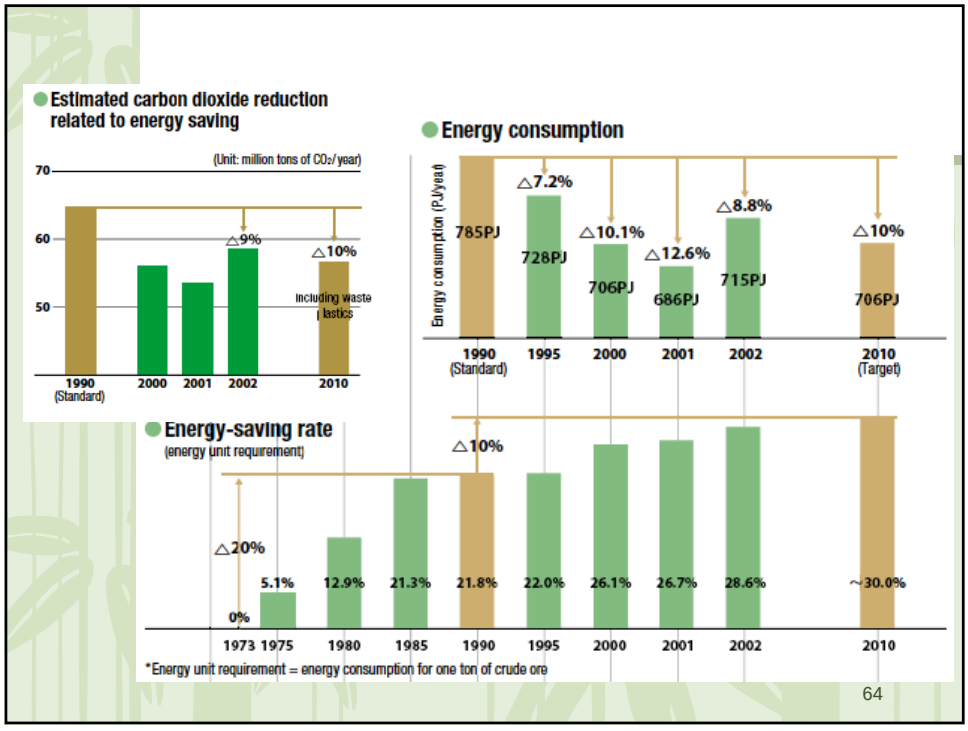
Estimated carbon dioxide reduction related to energy saving
(Unit: million tons of CO2/year)
70
60
50
△9%
△10%
Including waste plastics
1990 (Standard)
2000
2001
2002
2010
Energy consumption
Energy consumption (PJ/year)
785PJ
△7.2%
728PJ
△10.1%
706PJ
△12.6%
686PJ
△8.8%
715PJ
△10%
706PJ
1990 (Standard)
1995
2000
2001
2002
2010 (Target)
Energy-saving rate
(energy unit requirement)
△10%
△20%
0%
5.1%
12.9%
21.3%
21.8%
22.0%
26.1%
26.7%
28.6%
~30.0%
1973
1975
1980
1985
1990
1995
2000
2001
2002
2010
*Energy unit requirement = energy consumption for one ton of crude ore
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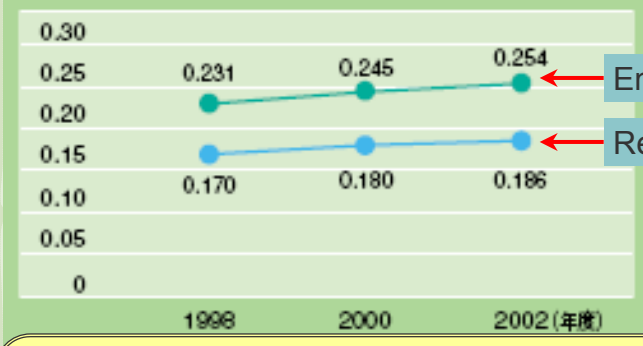
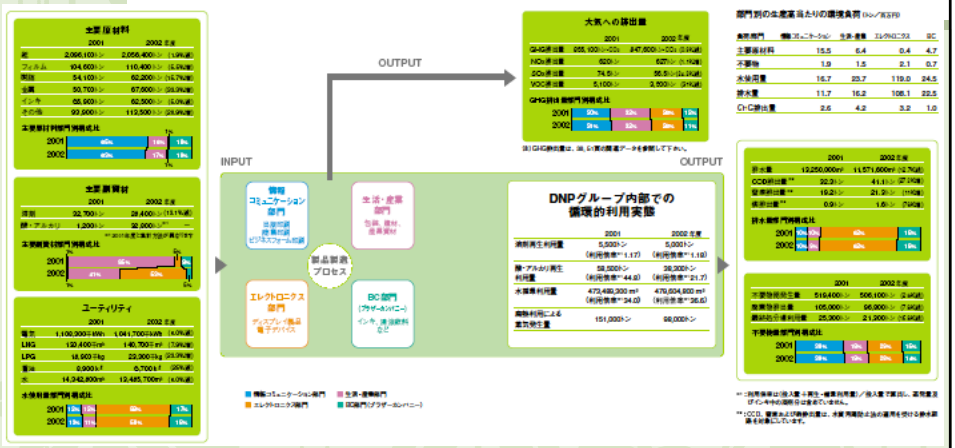
Ex. 2) DNP (Dai Nippon Publishing) Environmental Report

Environmental efficiency



$$\text{Energy efficiency} = \frac{\text{Production (hundred million yen)}}{\text{Energy consumption (TJ)}}$$

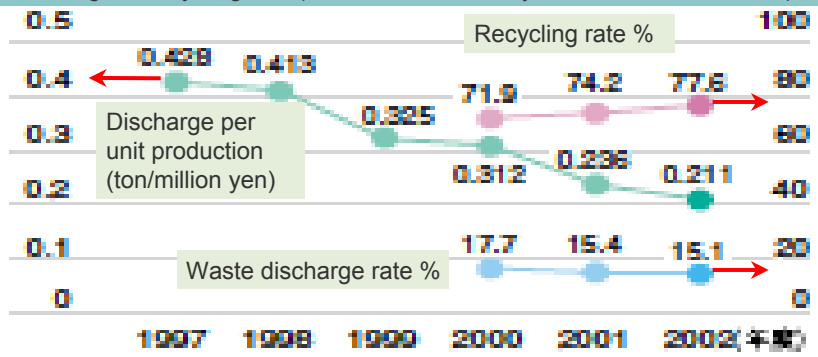
$$\text{Resource efficiency} = \frac{\text{Production (million yen)}}{\text{Material Input (ton)}}$$



Goal: Reducing industrial wastes

to achieve below targets by FY 2005

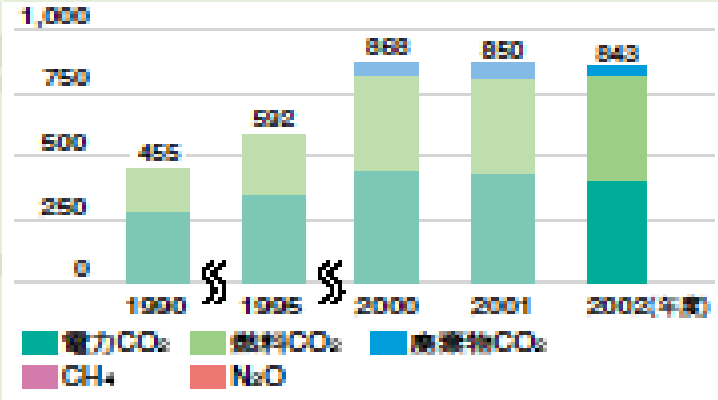
- Reducing discharge per unit production 20% as compared with FY 2000
- Achieving “Zero-emission” at 20 sites
- Reducing the waste discharge rate (amount of wastes / amount of material) 20% as compared with FY 2000
- Increasing the recycling rate (amount of waste recycled / amount of wastes) to 80%



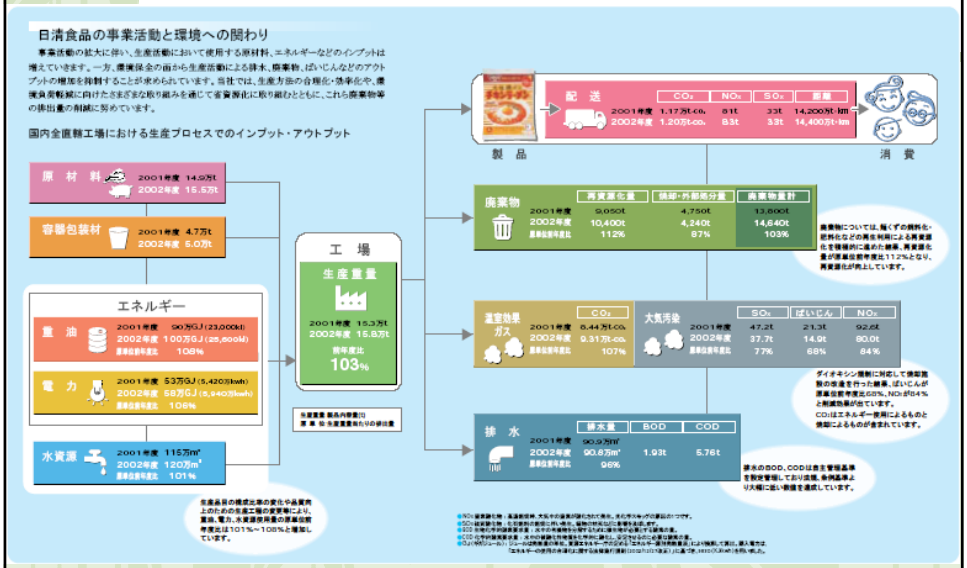
Goal: To achieve below targets by FY 2010

1. Keeping amount of greenhouse gases as same level as FY 2000
2. Keeping consumption of energy as same level as FY 2000
3. Reducing energy consumption per unit production by 15%, CO2 emission per unit production by 20% as compared with FY 1990

GHG emission (thousand ton)



Ex. 3) Nisshin Foods Environmental Report



Situation around Zero-emission and recycling

	2002	2001
Degree of Zero-emission achievement	97%	98%
Recycling rate	72%	66%
Recycling rate of food waste	89%	80%

■ゼロエミッション・再資源化の状況

	2002年度	2001年度
ゼロエミッション達成率	97%	98%
再資源化率	72%	66%
食品廃棄物のリサイクル率	89%	80%

※ゼロエミッション達成率の低下は、焼却炉のダイオキシン対策工事期間中に、廃棄物処理の外部委託があったためです。再資源化率の増加は、麺くずの配合飼料化の取り組み等の効果の現れです。

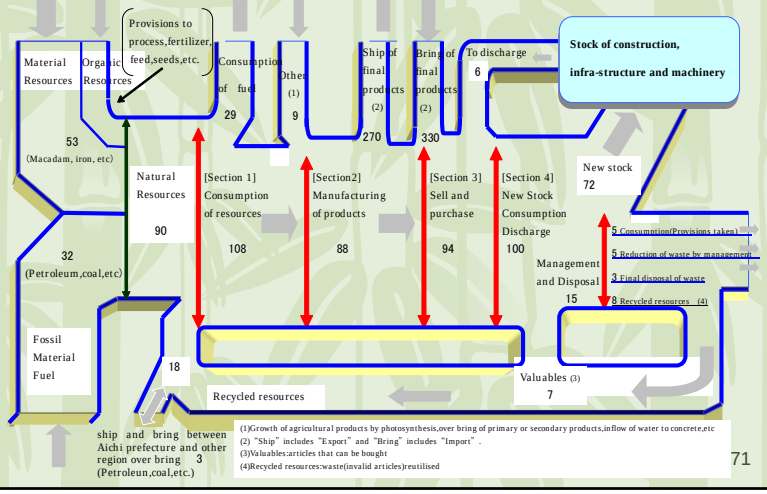
●ゼロエミッション達成率100%の定義 ――
工場から排出される産業廃棄物のすべてのものが資源として再利用されている場合、ゼロエミッション達成率100%とします。焼却時における廃棄物の再資源化の判断については、事業所内焼却については灰を有効利用した場合を再資源化とします。事業所外で外部焼却委託した時は廃熱回収あるいは灰を有効利用した場合を再資源化とします。
※費用対効果の観点から重量比99.5%をもって100%とします。

●再資源化率(%)＝[(有価物量＋産業廃棄物のうち再資源化した量＋自社内再利用)/産業廃棄物量]×100

●食品廃棄物のリサイクル率 ――
再資源化のうち食品残渣類の再資源化率です。

Material Flow Accounts by local government

Some prefectures are developing their MFA (ex. Aichi Pref.)



8. Other Topics

- International activities
- Future efforts

International activities

- International Expert Meeting on Material Flow Accounts and Resource Productivity (November 2003)
- OECD Council Recommendation on Material Flows and Resource Productivity (April 2004)
- Reduce, Reuse, and Recycling, "3R" Initiative agreed on G8 Sea Island Summit (June 2004)

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Future efforts

1) Measurement of
   a) International material cycle
   b) Hidden flows
   c) Amount of reuse
   d) Material flows by individual items

2) Indices regarding 3Rs with common methods of calculation

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