Japan's Experience in Promotion of the 3Rs

For the Establishment of a Sound Material-Cycle Society

Reduce
Reuse
Recycle

Ministry of the Environment

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Towards International Promotion of the 3Rs

Courtesy of CABINET PUBLIC RELATIONS OFFICE

Humankind has achieved breathtaking developments in science and technology at an incredible pace, which has enabled the realization of a society that is both convenient and comfortable. The other side to this development is evident in the number of global environmental issues that humankind now faces, not the least of which is climate change. With our lifestyles dependent on limited resources, it is essential that each and every one of us takes up these global environmental issues and endeavor to attain the mutual achievement of environmental protection and economic development.

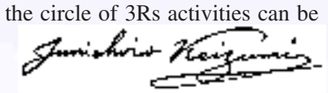
The importance of environmental protection is well understood in Japan, given our first-hand experience of pollution arising from the process of economic development. Today in Japan, people, businesses and the central and local governments are working cooperatively to establish a sound material-cycle society in which waste is reduced, reusable products are reused and waste is recycled as a resource under the Fundamental Law for Establishing a Sound Material-Cycle Society and the Fundamental Plan for Establishing a Sound Material-Cycle Society.

The key to mutually achieving environmental protection and economic development is the power of science and technology. The Japanese notion of “mottainai,” which recognizes value in things and reduces the amount of waste and reuses reusable items, has the potential to be even more effective when linked to science and technology.

At the Group of Eight (G8) Sea Island Summit in June of 2004, I proposed the creation of a sound material-cycle society, to which the leaders assembled at Sea Island showed their support. Japan is determined to lead the world in promoting the activities associated with the 3Rs, namely reducing, reusing and recycling waste. I will endeavor to see awareness of the dual concepts of the 3Rs and “mottainai” spread throughout the world, taking the opportunity provided by the Ministerial Conference on the 3R Initiative to be held in Tokyo in April 2005.

It is through the mutual achievement of environmental protection and economic development that we must pass on this beautiful earth to our children.

I sincerely hope that this brochure, which provides details of lessons learned in Japan through years of experience in dealing with environmental issues, will prove useful for people throughout the world who are seeking to intensify the 3Rs approach and that as a result, the circle of 3Rs activities can be expanded even further.

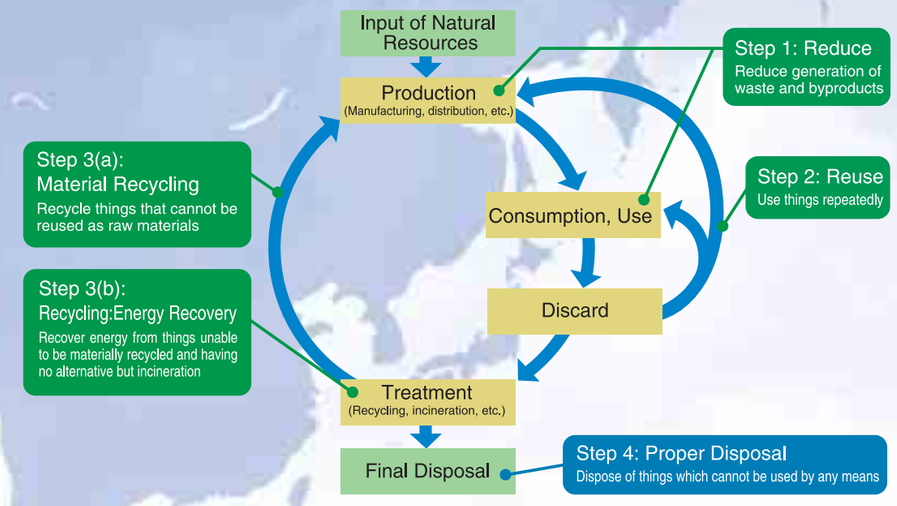


Junichiro Koizumi
Prime Minister of Japan

Contents

What are the 3Rs?

The principle of reducing waste, reusing and recycling resources and products is often called the “3Rs”. Reducing means choosing to use things with care to reduce the amount of waste generated. Reusing involves the repeated use of items or parts of items which still have usable aspects. Recycling means the use of waste itself as resources. Waste minimization can be achieved in an efficient way by focusing primarily on the first of the 3Rs, “reduce,” followed by “reuse” and then “recycle.”

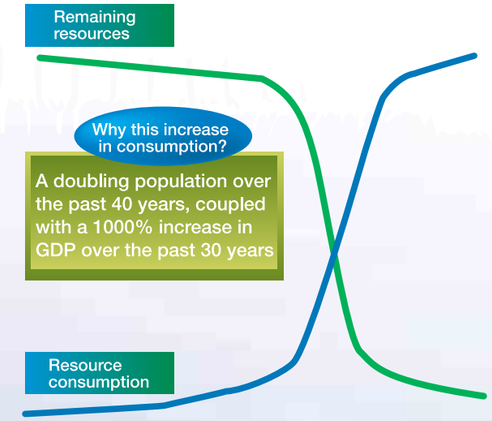


The Case for the 3Rs in Today's World

The global demand for resources has been increasing sharply because of increases in the population and the economic expansion. The consumed resources ultimately become waste, imparting negative impacts on water, the air and the global environment. Although developed countries are consuming much of the resources at present, developing countries are also experiencing an increasingly serious waste issue due to the progress of urbanization and economic development.
This trend is expected to accelerate in the coming years, and the advancement of globalization will further stimulate the international movement of products and recyclable resources.
Thus, establishing a sound material-cycle society with a reduced environmental load through the collaboration of all countries has become an issue to be addressed. The establishment of sustainable production and consumption patterns through the 3Rs is necessary to realize a world in which people can enjoy highly fulfilled life.

Environmental Degradation Due to Rapid Growth in Resource Use

It is critical to create sustainable patterns of production and consumption.



Society of mass production, consumption & disposal is unsustainable

Global warming | Ozone depletion | Acid rain | Deforestation | Waste problem

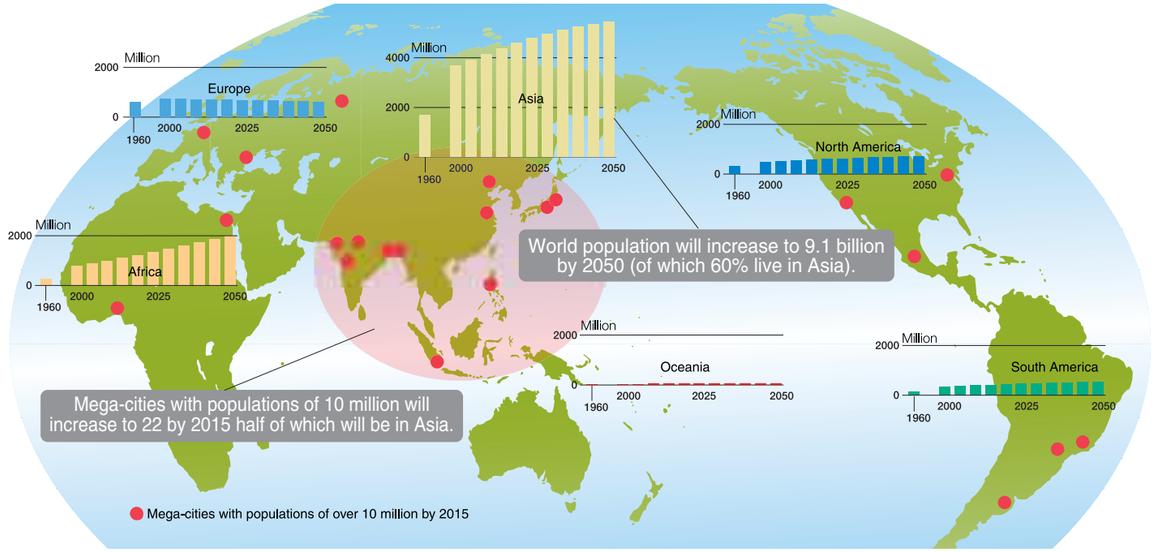

Increasing wastes


Improper waste disposal

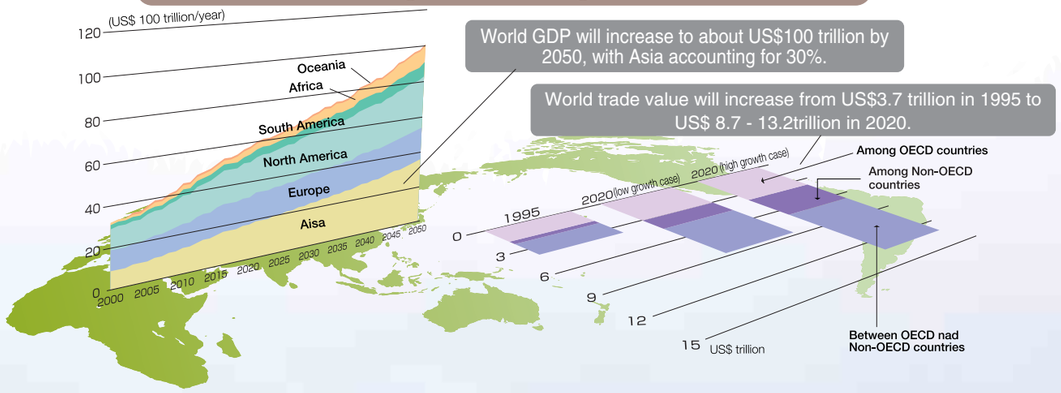

Rapid increase in hard-to-manage wastes

Efficient Use of Resources is Now a Global Challenge

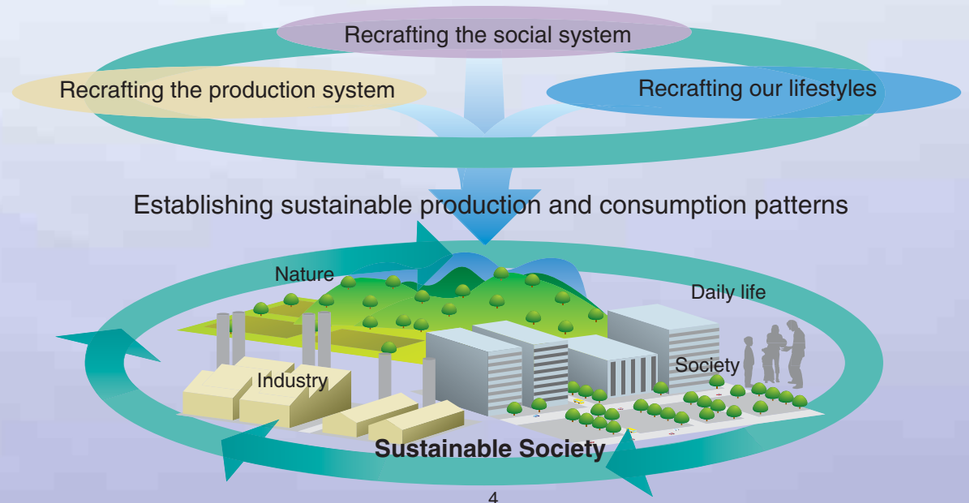
Increasing world population and urbanization



Economic growth and globalization



The 3R Initiative: Promoting a sound material-cycle society internationally through the 3Rs



Japan's Experience: A Sound Material -Cycle Society Evolving through Trial and Error

In Japan, policies designed to maintain and improve public hygiene began in the 1950's. In the 1960's, damage to human health by severe industrial pollution became social issues, typically represented by four major cases of pollution accompanying rapid economic growth, namely Minamata Disease (mercury poisoning), Niigata Minamata Disease, Yokka-ichi Asthma and Itai-Itai Disease (cadmium poisoning). In response, strenuous efforts began in the 1970's for environmental conservation. In the 2000's, full-scale efforts to establish a sound material-cycle society, in which the consumption of natural resources is minimized to reduce the environmental load, have commenced in order to bring about the co-existence of the environment and economic prosperity.

	1950's	1960's	1970's	1980's	1990's	2000's
Economic activity	Postwar reconstruction	High economic growth Tokyo Olympics; bullet train launched ('64)	Oil crises Osaka Expo ('70) Introduction of floating yen ('73)	Stable economic growth Rapid appreciation of the yen	Record high yen-US dollar exchange rate ('95)	Low economic growth Aichi Expo ('05)
Evolution of social objectives	Improvements in public health		Environmental protection			Establishment of a sound material-cycle society
Relevant Laws and Policies	Public Cleansing Law ('54)	Basic Law for Environmental Pollution Control ('67)	Waste Management Law ('70) Introduction of Polluter Pays Principle Environment Agency established ('71; → Ministry of the Environment '01)		Law for Promotion of Utilization of Recyclable Resources ('91) Introduction of Extended Producer Responsibility Basic Environment Law ('93)	Law for Promotion of Effective Utilization of Resources ('00) Fundamental Law on the Establishment of a Sound Material-Cycle Society ('00)
World Environmental Events		United Nations Conference on the Human Environment ('72) Publication of *(Limits to Growth)* ('72)			United Nations Conference on Environment and Development ('92)	World Summit on Sustainable Development ('02)

Million tons

400

100

50

◎A 3R Society in the Edo Period (1603 - 1868)

A system of near-complete recycling existed in the Edo Period. Farming households in rural areas recycled reusable resources. Straw, for instance, was used after the rice harvest as fertiliser, fuel and raw materials for articles of daily use. The only goods sourced externally were salt and iron. Castle towns had recycling professionals, repairing broken tea cups and recovering the ends of candles to produce new ones, for example.

Moreover, night soil from urban areas was used as fertiliser in rural areas while crops from rural areas were consumed in urban areas, constituting an effective material cycle and preserving the cleanliness of urban areas.

Illegally disposed industrial waste

◎Industrial Pollution

As symbolised by Minamata Disease, the health of many people was damaged by waste water and/or exhaust gas from factories and mines. The liability of companies as the parties responsible was pursued rigorously.

Helicopter spraying insecticides over waste landfill

Waste collection by trucks

Waste collection by packer vehicle

Waste reduction and recycling by companies

Generation of industrial waste

Start of administration of industrial waste management

Eco-mark goods in the market

Recyclable resources collected from households

Strengthened measures govern illegal waste disposal

Advance of 3R-related technologies (design for the environment)

Million tons

400

100

50

Organizational development of waste management by the central and local governments

Waste evolves into a social issue

Modernization of waste management

Opposition to waste management facility construction

Government launches actions to reduce waste

Inability to handle waste management by focusing on the disposal stage exclusively

Measures to create a sound material-cycle society

Generation of municipal waste

◎Johkasou

Raw sewage used to be carried in wooden buckets to the fields for use as fertilizer. With the spread of flush toilets through urbanization, it began to be disposed of directly into rivers.

In the early 1990's, a Johkasou system was devised to decompose the organic matter in sewage through the work of microbes to maintain clean river water. Many improvements were subsequently made and the system today is capable of simultaneously treating both raw sewage and household waste water.

Major indicators	(1965)	(1975)	(1985)	(1995)	(2000)
GDP per capita, in US$* *calculated at US$1 = ¥145 (1990 rate)	7,737	14,445	19,539	25,368	26,405
Municipal solid waste generation per capita (g/person·day)	693	1,033	982	1,105	1,132

Improvement in Waste Management: Efforts by Central and Local Governments

In Japan, central and local governments have been playing an important role in the management of municipal waste. The central government has stipulated the management framework for municipal waste and conducts information gathering and utilization, technological development and the provision of assistance to the local governments. Meanwhile, the local governments have created modern waste collection systems using the know-how which they accumulated when establishing public hygiene mechanisms as the amount of generated municipal waste increased sharply during the period of high economic growth in the 1960s. Subsequently, both the central and local governments have intensified their efforts to modernize sanitation and to implement environmental conservation measures.

Start of Municipal Waste Management

Around 1890, local governments developed and introduced human resources and new technologies in order to combat the spread of infectious diseases. This experience formed the foundations for the establishment of a management system for municipal waste. Local residents also played a significant role through their cooperation for waste collection and through their understanding of the importance of the beauty and the hygiene of their towns.

Collection of human waste (1959)

Transfer of waste to a truck (1951)

Residents cooperating in waste collection (1957)

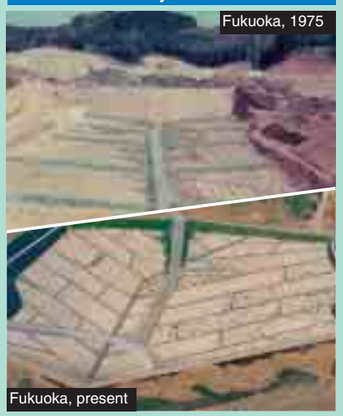
Modernization of Municipal Waste Management

Modernisation rapidly progressed to treat the rapidly increasing amount of municipal waste in a sanitary manner. Packer trucks were introduced to replace manual collection, starting regular collection. Continuous-loading waste incinerators were introduced in addition to batch-loading incinerators, and further emission control measures were promoted. The sanitary (semi-aerobic) landfill method was introduced together with liner sheets and thorough leachate treatment.

Waste Collection

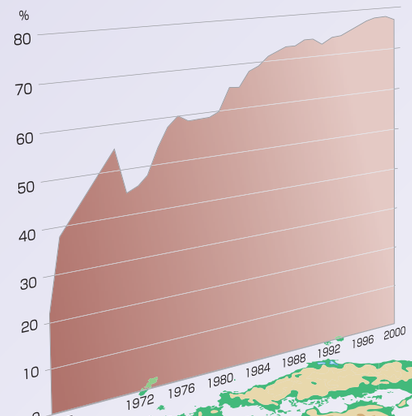
Waste Incinerators

Sanitary Landfills

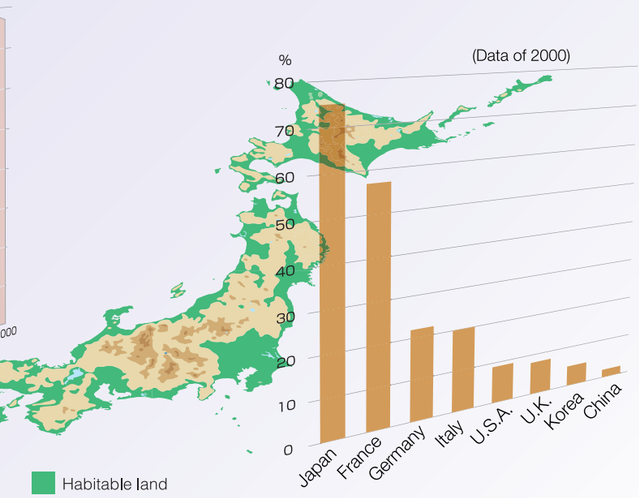


Why is incineration so common in Japan?

Growth in Incineration in Japan



Comparison of Incineration Rates



Rationale for Incineration

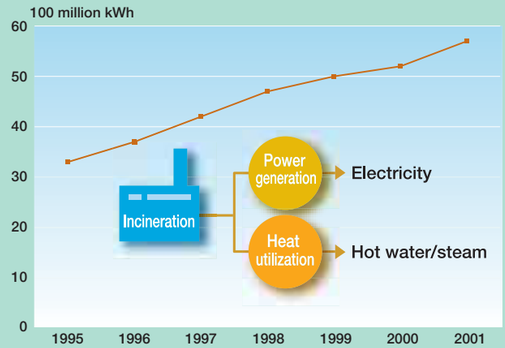
Limited habitable land (about 30% of the territory)→Necessity of waste volume reduction
High temperature and humidity in summer→Necessity of rapid, sanitary waste treatment

Introduction of Advanced Environmental Measures

The local governments conduct ongoing efforts for the coexistence of people and waste incinerators, such as gas emissions control via the strict maintenance of incineration temperatures and appearance of the incinerator within the landscape.

Incinerator in urban area

In cities generating a large amount of solid waste, active efforts are being made to effectively use the exhaust heat from incineration for power generation and other purposes.

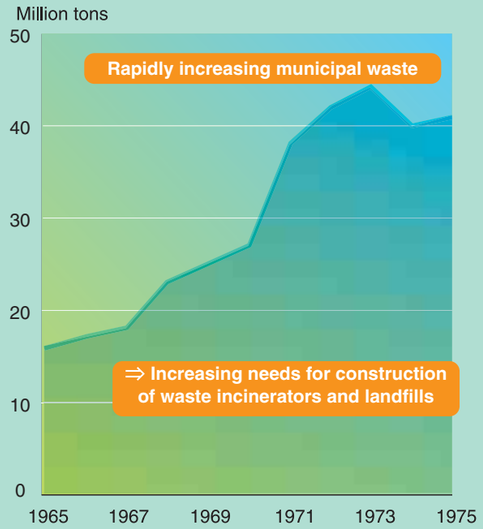


Power generated by waste incinerators

Three Keys to Success: Understanding, Participation, and Cooperation

Serious conflicts occurred between local governments, which wanted to establish waste management facilities such as incinerators and landfills to deal with the rapidly increasing municipal waste during the period of high economic growth, and local residents, who were concerned about a worsening of the local environment due to these facilities. The campaigns against waste management facilities by residents spread throughout Japan, and in some cases there occured clashes between them. Through these experiences, however, both local governments and residents learned the importance of dealing cooperatively with the issues of management and reduction of municipal waste.

Intensified Campaigns against Waste Management Facilities by Residents



NIMBY

NIMBY is an abbreviation for "Not In My Back Yard" and signifies the psychological stance in which people oppose the construction of "nuisance" facilities in their own local area even while accepting that a need for such facilities exists. As the construction of waste management facilities near residential areas in Japanese cities was often necessary, in some cases NIMBY manifested itself strongly.

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Tokyo's Waste War

A serious social problem described as "a waste war" occurred in Tokyo, beginning when Koto Ward, where the New Yumenoshima landfill site was located, refused in 1971 to accept solid waste from Suginami Ward, where local residents had opposed the construction of a new waste incineration plant (Suginami Incineration Plant) to treat the municipal waste generated in their own ward. This waste war lasted for nearly three years with the local authorities and residents of the two wards clashing against each other.

This war was an important incident in terms of shedding light on the problem of waste, which had so far attracted little social attention. People came to think about the way society functioned, resulting in enormous amounts of waste, and began to realize the necessity of reducing and recycling waste. Funds and technologies began to be channeled into means of reducing the increasing amounts of waste as well as methods for appropriate management.

Residents opposing construction of waste management facilities

Conflict

Lessons Learned from Disputes over Waste Management

Local Governments

Local governments have become increasingly aware of the importance of disclosing environmental information concerning municipal waste management facilities to obtain the understanding of local residents and other stakeholders and of proceeding with efforts to reduce the amount of municipal waste in cooperation with local residents and businesses.

Residents

Local residents have become aware that they are the generators of municipal waste and realized the need to recycle, including sorting wastes based on type, as well as to generate as little waste as possible at home.

Cooperation

Rule setting

Creation of posters

Rule-based sorting of waste

Awareness-raising

Integration of environmental education into the school curriculum

Collection of recyclable resources through community-based organizations

On-site visits to waste incinerators

Providing one's own bag when grocery shopping

Inadequacy of a Waste Management Strategy Focusing Solely on Disposal

The rapid increase in municipal waste prompted local residents and local governments to work together to sort waste paper and packaging and other items for reuse or recycling, using group-based collection. Lifestyle changes and improvements in the standard of living, however, have brought about a continuous increase as well as diversification of municipal waste.

As it became apparent that the efforts of local residents and local governments alone were insufficient for the proper management of municipal waste, the central government faced the urgent task of creating a mechanism whereby all stakeholders, including businesses, local residents and local governments, cooperated to reduce municipal waste.

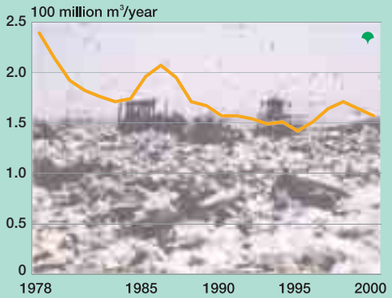
Increases in Waste and its Changing Nature

Over the last 40 years since the period of rapid economic growth began, the amount of household waste has tripled by weight. The nature of waste has also changed to include plastic containers and packaging, advertisement flyers, leaflets and old newspapers, and kitchen refuse and left-over food. Towards the end of the 1990's, TV sets and other home appliances became highly noticeable among municipal waste.

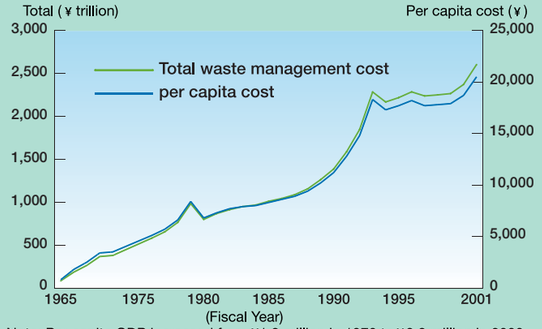
Dwindling Landfill Capacity and Increasing Waste Management Costs

The increased amount of municipal waste caused a shortage of landfill sites while the cost of municipal waste collection, transportation, treatment and disposal sharply increased.

Remaining Landfill Capacity



Waste Management Costs



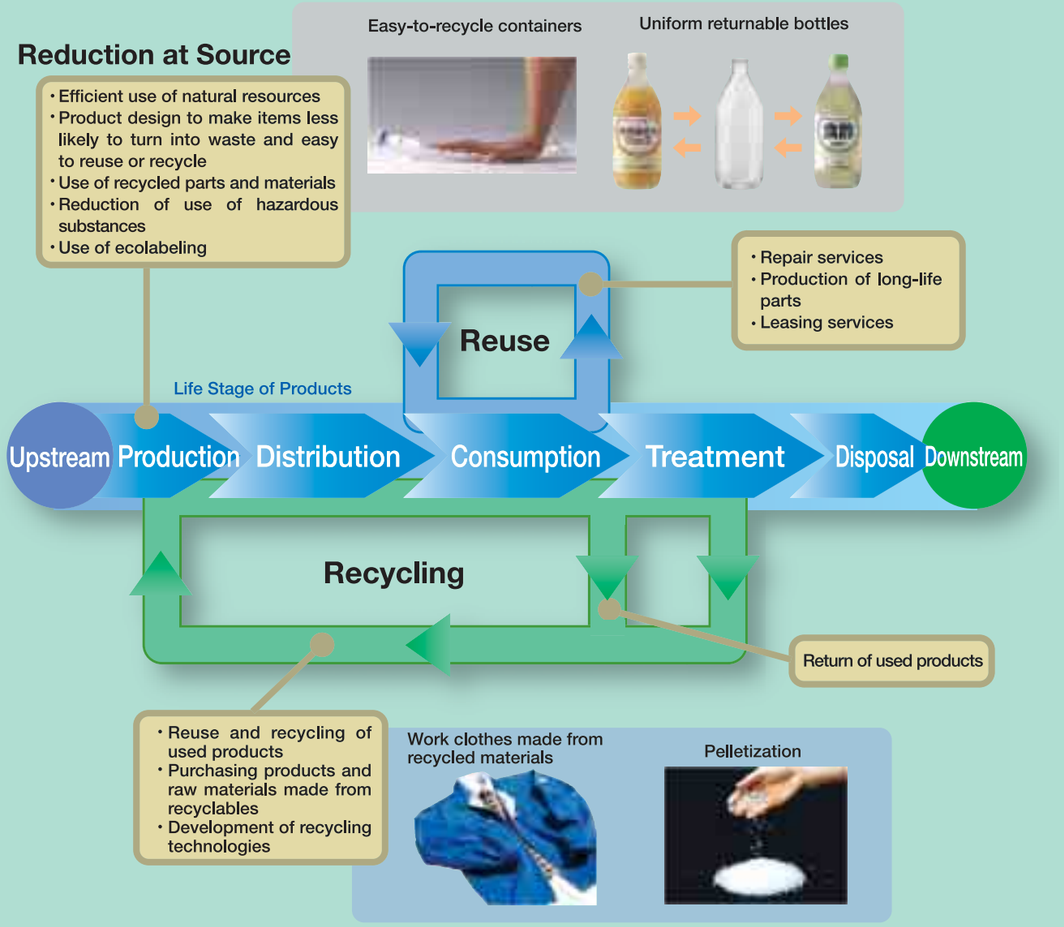
Note: Per capita GDP increased from ¥1.8 million in 1970 to ¥3.8 million in 2000

New Approach to Reducing Waste:
Extended Producer Responsibility (EPR)

Municipal waste used to be mainly managed at such downstream responses as the recycling and disposal of products discarded as waste. This system eventually was overwhelmed by the ever-increasing amount of municipal waste, leading to the emergence of the idea of extended producer responsibility (EPR), whereby manufactures would be responsible to a certain extent for the adequate reuse, recycling and disposal of their discarded products.

As a result, manufactures are now required to adopt the LCA (Life Cycle Assessment) approach to minimize the negative impacts of their products on the environment throughout life cycle of a product, and they have begun the development of new products which are less likely to turn into waste, easy to reuse or recycle or imparting fewer impacts on the environment when discarded.

Actions based on EPR

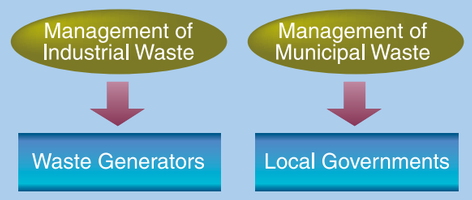


Responsibility Lies with Waste Generators: A Fundamental Principle

Industrial activities produce both products and waste. Industrial waste was initially disposed of on the premises of the plants generating the waste or in landfills administered by local governments. However, the increase in and diversification of industrial waste since the 1960's made it difficult for local governments to play the main role in the management of industrial waste. It was also at this time that the importance of properly managing industrial waste was recognized keenly because of the occurrence of severe industrial pollution that caused Minamata Disease and other serious threats to human health.

Establishment of a National Framework for Waste Management

The Waste Management Law enacted in 1970 classified waste into industrial waste, discharged from business activities, and general waste (municipal waste), and set forth business entities (industrial waste generators) and local governments as responsible for management of industrial and municipal waste, respectively.



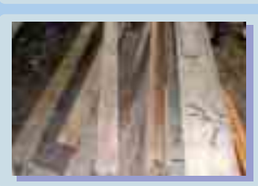
What is industrial waste?

Among the many types of waste generated through business activities, twenty types are classified as industrial waste.

Waste plastics

Sludge

Concrete debris



Wood pieces

Responsibility for waste Management lies with the waste generator

Generators of industrial waste are required to manage waste at facilities authorized under the applicable management standards.

Truck for industrial waste transportation

Incinerator for industrial waste

Landfill for industrial waste

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History of Industrial Waste

In Japan, waste is classified into industrial waste and municipal waste in order to clarify who is responsible for waste management. The responsibility to manage industrial waste lies with waste generators, who are regulated under the Waste Management Law. The background for this structure was the strong social demand to prevent a recurrence of Minamata Disease and other health threats that had arisen from industrial pollution.

In the 1970's and 1980's, environmental pollution from illegal dumping of wastes became a serious problem, necessitating the introduction of a system in 1991 that mandates special management for hazardous waste* separately from industrial waste and municipal waste.

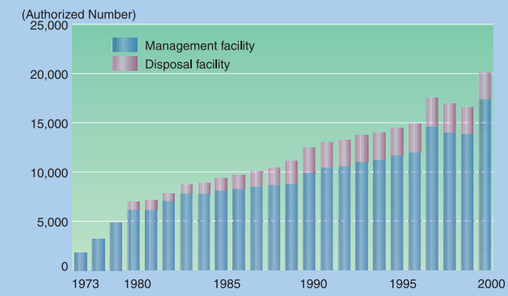
* In the Waste Management Law, this is referred to as "specially controlled solid waste."

Establishment of Organizations for Industrial Waste Management

Market Development

Waste generators are allowed to contract with a third party to have their industrial waste managed, resulting in the establishment of industrial waste management market. Along with the number of management facilities for industrial waste, the number of businesses involved in its collection, transport, intermediate treatment and/or final disposal has increased to comprise a market of ¥2-4 trillion (0.4 - 0.8% of Japan's GDP) today.

* 107 yen / USD (April 2005 rate)



Number of Authorized Industrial Waste Management Facilities

Administration of Industrial Waste

Local governments conduct on-the-spot inspection of both industrial waste generators and companies which collect, transport, or dispose of industrial waste in order to determine if the waste is being managed properly.

The proper control of industrial waste demands the constant enhancement of the professional capabilities of the relevant staff members of local governments. For this reason, a central government organization provides training for these staff members.

Local government staff supervising transporters of industrial waste

Business Efforts Resulting in Environmental and Economic Benefits

The establishment of a mechanism by which business entities treat the industrial waste they discharge in accordance with their responsibility means that generators pay the costs of the management of industrial waste. Because of this, business entities have begun to reuse actively the waste generated through their production processes or reconsider their procuring of raw materials. Business entities have also been making progressive efforts to reconsider their manufacturing methods to reduce the amount of industrial waste.

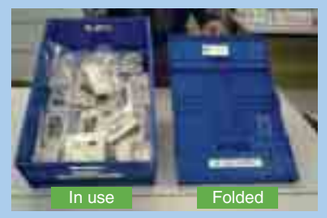
As a result, there is a growing realization of a win-win relationship in which the generators of industrial waste and the users of such waste (recyclable resources) can reduce the management cost and the raw material procurement cost respectively while reducing the environmental load. The reuse and recycling of waste have produced a new environmental business, namely, the recycling business.

Meanwhile, environmentally-sound technologies have made great progress, as the introduction of the EPR principle has stimulated the development of not only waste management and recycling technologies but also design and manufacturing technologies for environmentally-sound products.

Examples of Efforts by Business Entities

Reduction

Reusable boxes are used for transporting raw materials and manufactured goods.

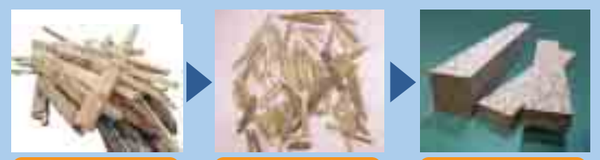


Reuse

Parts of used automated teller machines (ATMs) are reused as maintenance parts of other ATMs

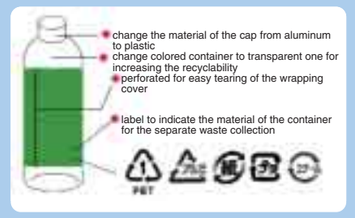
Recycling

Construction waste to construction materials



Usable as structural materials such as pillars and sills

Design for easy recycling



Achieving a Win-Win Situation:Attaining Economic and Environmental Benefits

Example of Company A

Company A, a manufacturer of precision equipment (net sales of -¥150 billion with 3,700 employees), realized in fiscal 2003 the environmental and economic benefits shown in this table through lessened consumption of resources, the reduction/recycling of waste and measures designed to reduce the amount of materials procured.

Effects of Environmental Protection, Compared with the Previous Year		Economic Benefits (million yen)
Water consumption	▲44,000m³ (5%off)	21.1
Paper consumption	▲4t (5%off)	
Waste generation	▲473t (14%off)	40.5
Reduction of use of raw materials	▲842.1t	450.4

107yen / USD (April 2005 rate)

Economic Benefits

The economic effects of the recycling sector, including the manufacture of recycling equipment, supply of recycling services and manufacture of products using recycled materials, are now equivalent to 1.6% of Japan's GDP.

Recycling Industry Market Scale and Employment Figures

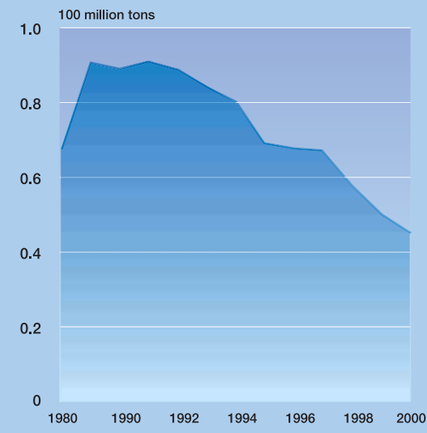
	2000(Existing)	2020(Forecast)
Market scale	¥8.2 trillion	¥10.5 trillion
Employment	212,000	232,000

107yen / USD (April 2005 rate)

Environmental Benefits

The amount of industrial waste landfilled annually in Japan has been decreasing since 1990.

Weight of Landfilled Industrial Wastes



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Factors Encouraging Companies to Promote the 3Rs

Japanese companies had an early start in using the 3Rs to deal with industrial waste. Factors prompting these efforts include those listed to the right. In 1997, the Japan Federation of Economic Organizations (the "Keidanren") announced the Voluntary Environmental Action Programme, focused primarily on measures for climate change mitigation and industrial waste management, which facilitated an industry-wide approach for dealing with environmental issues. Numerical targets for waste management were set in 1999 and the degree to which targets are being achieved is reviewed annually.

- Difficulty of securing disposal sites for industrial waste because of insufficient land
- Slow economic growth after the peak period in the 1960's lower production costs
- Price hikes in raw materials by the two oil crises lower production costs
- As a result of the introduction of Extended Producer Responsibility, there is a demand for a Life Cycle Assessment approach, where attention should be paid to recycling or final disposal

The Need for a Level Playing Field

One major premise for the proper functioning of waste management and the 3Rs mechanisms is that all stakeholders act by setting up rules while respecting the purposes of these mechanisms. Unlike wastewater or exhaust gas, however, the environmental pollution caused by industrial waste at the discharge stage is difficult to identify. Moreover, the transfer of industrial waste between different businesses makes it extremely difficult to monitor the situation, and it is a fact that some people are engaged in illegal dumping or illegal transboundary movement of wastes.
The social mechanism begins to malfunction if the economic gain by those involved in illegal acts is left unchallenged and uncontrolled. Illegal waste dumping, a typical example of an illegal act, causes not only an obvious adverse impact on the environment but also major economic losses because of the massive cost of restoring the environment back to the original state.
The prevention of such a situation to ensure a level playing field among businesses is one of the important roles of the central and local governments.

Cases of Illegal Dumping and Transboundary Movement of Wastes

Industrial waste consisting of waste oil and sludge containing such toxic substances as cadmium and lead discharged by chemical plants and the like was illegally dumped at Teshima Island in Kagawa Prefecture which is located in the Seto Inland Sea National Park (1978 to 1990).
Amount of waste, etc. dumped illegally:
- Approx. 562,000 m^3
- Costs of restoration:
  Approx. ¥44.7 billion (estimated)

*107yen / USD (April 2005 rate)

Illegal Waste Dumping in Japan
- Cases not resolved: 2,320
- Amount remaining:
  about 12.67 million tons

Data as of March 2004

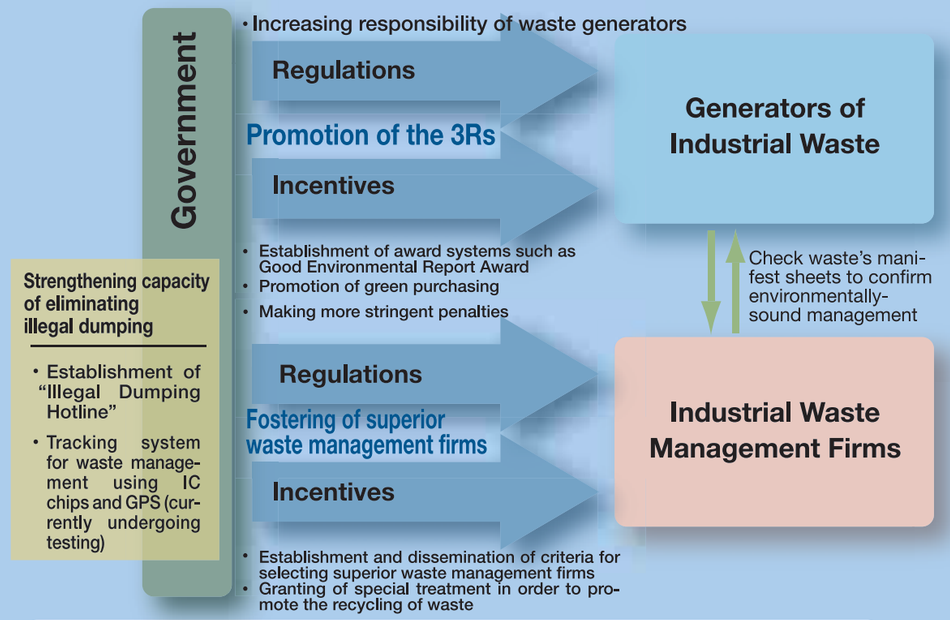
In some cases, home appliances collected for recycling have been illegally dumped.

Medical waste containing used syringes, tubes for intravenous drips and used disposable diapers, etc. were found in exported consignments purporting to be recycled paper (1999).
- Amount of the wastes illegally exported: 2,000 tons
- Take back and treatment/disposal costs borne by the government: approx. ¥280 million

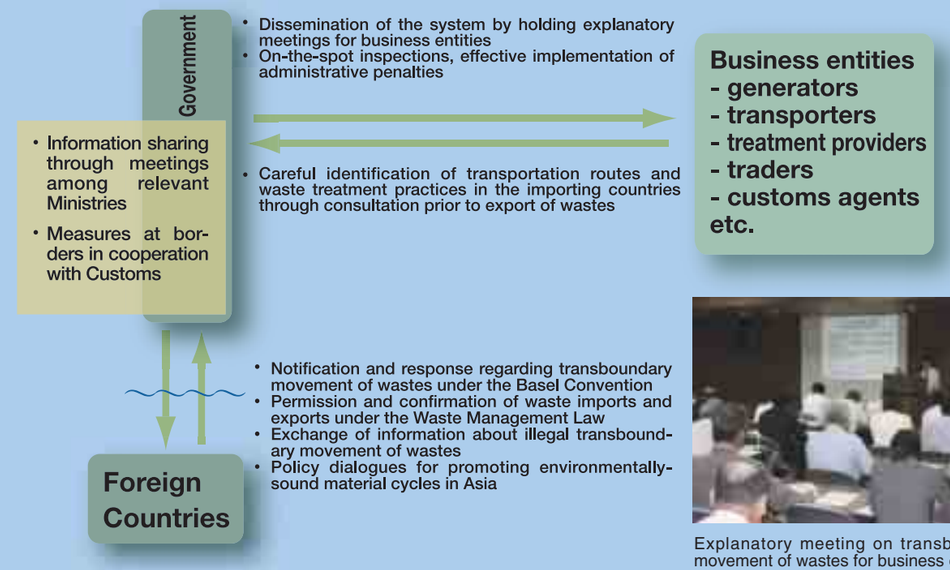
*107yen / USD (April 2005 rate)

Enhancement of Measures to Ensure Fair Rules

Promotion of domestic waste management



Promotion of measures against illegal transboundary movement



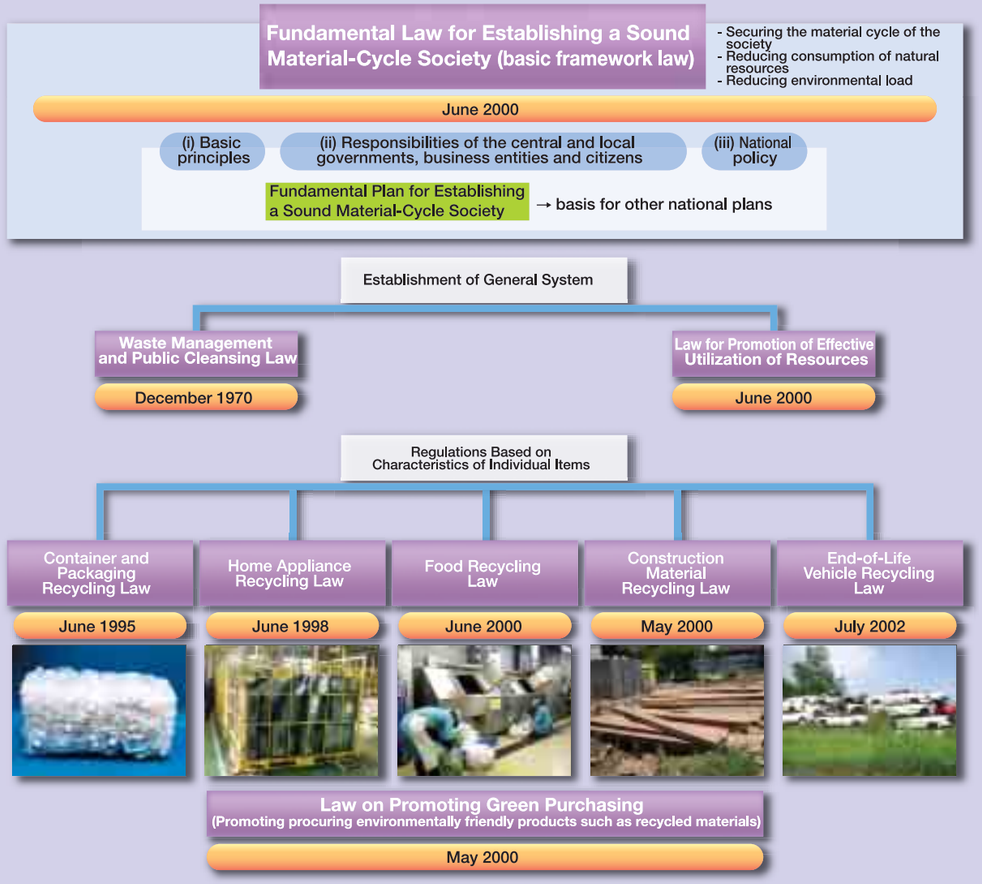
Explanatory meeting on transboundary movement of wastes for business entities

Evolution from Waste Management to the 3Rs

The realization of sustainable development requires the establishment of a sound material-cycle society in which the consumption of natural resources and the environmental load are reduced. Japan has been attempting to achieve this based on two pillars: promotion of the 3Rs and environmentally-sound management of waste.

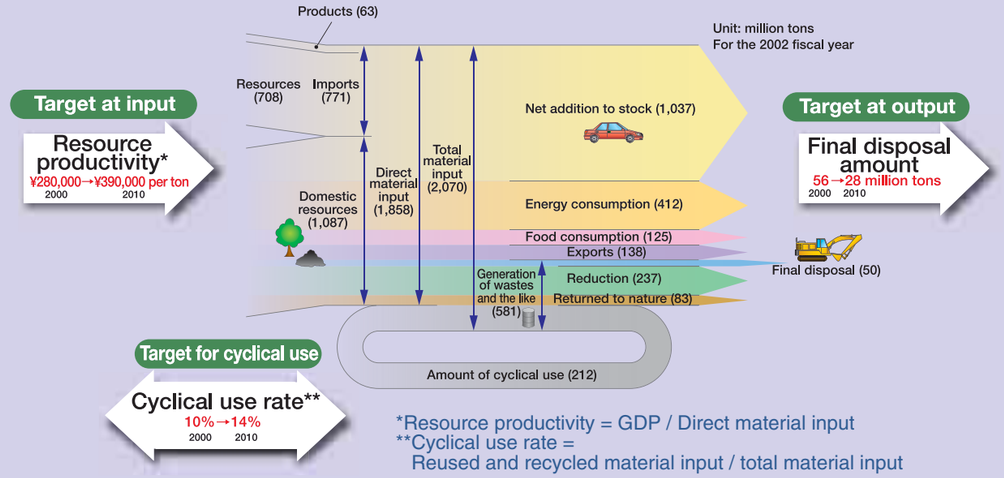
Legal System for a Sound Material-Cycle Society

Within the basic framework provided by the Fundamental Law for Establishing a Sound Material-Cycle Society, the Law for Promotion of Effective Utilization of Resources has been introduced to cover the production stage along with various laws regulating the collection and recycling stage in correspondence with the specific characteristics of individual products or goods, and the Waste Management and Public Cleansing Law to cover the waste management stage. In addition, the Law on Promoting Green Purchasing has been enforced to facilitate the purchase of products which take the environmental impacts at the consumption/use stage into consideration.



Planned Actions for a Sound Material-Cycle Society

The Japanese Cabinet adopted the Fundamental Plan for Establishing a Sound Material-Cycle Society in 2000 to realize the goal, and a systematic approach is being taken under this law with concrete numerical targets being set for the target year of 2010. For the establishment and follow-up of these numerical targets, data on how many resources are used to make such products as automobiles and home appliances and buildings, etc., how many are recycled and how many are finally disposed of as waste are applied.



*Resource productivity = GDP / Direct material input
**Cyclical use rate =
Reused and recycled material input / total material input

From fiscal 2005, a new approach is under way whereby the central government and local governments jointly formulate local plans to promote the establishment of a sound material-cycle society, set targets to promote the 3Rs and implement the necessary measures as a package.

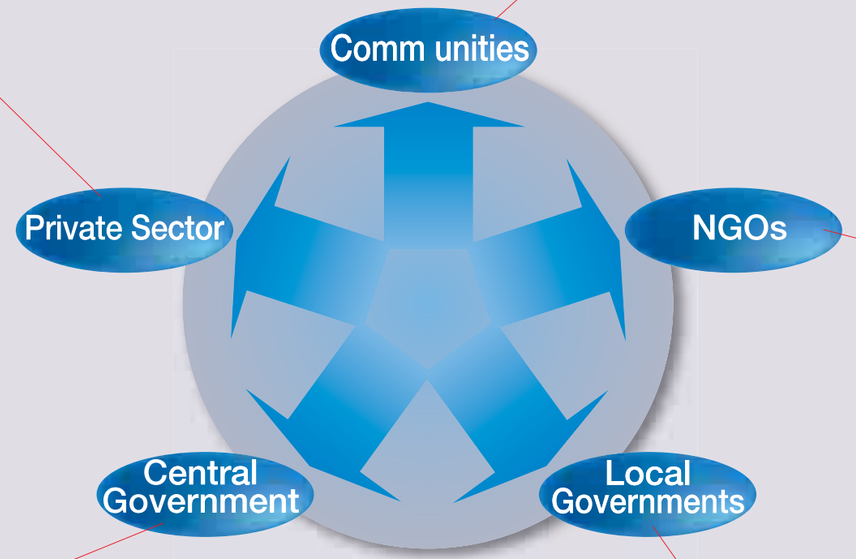
Council on Promotion of Establishing a Sound Material-Cycle Society
(Collaboration among the central and local governments beginning with the conceptual stage)

Local Plans on Promotion of Establishing a Sound Material-Cycle Society

- **Implementing bodies: Municipalities with a certain population or greater**
- **Targets: Reduction (generation of waste per capita), recycling rate, amount of final disposal**
- **Policy packages: Development of facilities for material and thermal recycling and final disposal etc.**
  (with the central government providing grants for part of the project costs)

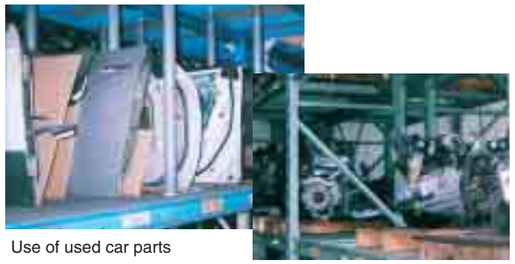
The Roles of Various Stakeholders

The efforts of the entire society, through the cooperation of all stakeholders, are necessary and, indeed, indispensable for the establishment of a sound material-cycle society. The Fundamental Plan for Establishing a Sound Material-Cycle Society sets forth clearly-defined roles for such stakeholders as the central government, local governments, the private sector, communities and NGOs so that these bodies can proceed with their own efforts with a full awareness of their expected roles.



Private Sector

·Providing environmentally-sound goods and services
·Take back and reuse/recycling of used products in keeping with EPR
·Environmentally-sound management of wastes
·Establishment of an environmental management system
·Provision of information to consumers (environmental labels and environmental reports)



Use of used car parts

Recycling of food waste

Central Government

The Central Environment Council, with stakeholder representative participants

·Development of systems, such as preparation of the legal framework
·Subsidies and preferential taxation for facilities, and research and development for establishing a sound material-cycle society
·Support and information provision to encourage citizens and NGOs to take voluntary actions
·Preparation of basis for stakeholders' actions
·Taking actions as a business entity and a consumer (e.g., green purchasing)
·Promotion of international cooperation and policy dialogues in the field of the 3Rs

Comm unities

·Selfrecognition as waste generators to give adverse impacts to the environment
·Reconsideration of one's lifestyle
·Selection of environmentally-sound goods and services
·Participation in 3R-related activities such as thorough sorting of wastes
·Participation in 3R-related policy making

Thorough sorting of containers

NGOs

·Promotion of practical actions at the local level
·Promotion of awareness-raising
·Providing environmental education and learning (e.g., community study sessions)
·Monitoring of actions by business entities and governments
·Submission of policy proposals
·Holding seminars for government and company personnel by non-profit business associations

Community study sessions

Local Governments

·Ensuring enforcement of laws and ordinances
·Preparation of action plans
·Green purchasing, awareness-raising, information disclosure
·Assuring community participation in the decision-making process for relevant policy measures
·Development of hubs for 3R-related businesses
·Acting as local coordinator for the establishment of a sound material-cycle society
·Development of spaces and opportunities for exchange of used goods and information, and providing fora for study on recycling (e.g., recycling plazas)
·Promotion of international cooperation

Development of plans with community participation

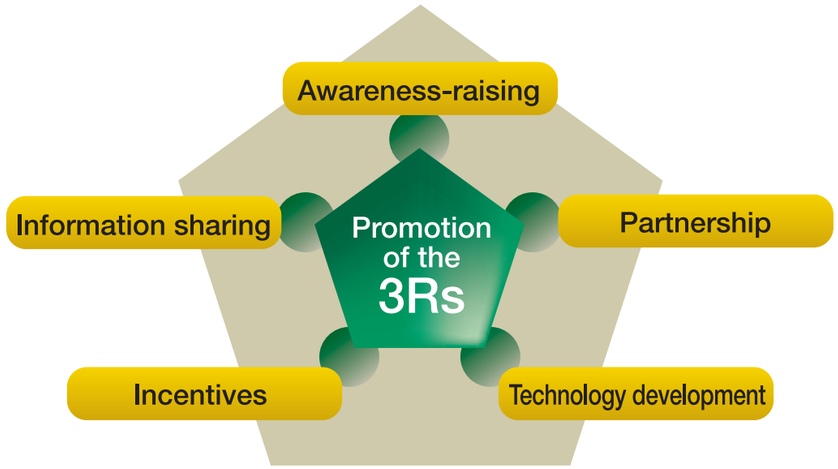
Repairing broken ceramics

Furniture repair

Recycling Plaza

Five Keywords for a Sound Material-Cycle Society

For the promotion of the 3Rs as the foundation for the establishment of a sound material-cycle society, various approaches are necessary, focusing on the increasing of awareness, partnerships between various bodies, sharing of information, technological research/development and incentives. Effective linkage between these diverse approaches will achieve multiplied or synergistic effects, making the effective promotion of the 3Rs possible.



Awareness-raising

For the promotion of 3R-related activities, it is essential that stakeholders understand the importance of their cooperation among them. For this reason, promotion of environmental education designed to make people recognize the necessity for 3R-related activities is required in addition to the consolidation of basic education and the promotion of hygiene education. The improved awareness of people will lead to fostering a basis upon which 3R-related efforts, technologies and policies are accepted.

Preparation of posters, holding poster competition

Prize posters in 2003

Discarded can collection by Junior Eco-Club

Study on recyclables sorting by Junior Eco-Club

Information Sharing

For the promotion of the 3Rs, information leading to 3R-related activities must be widely shared by all stakeholders. Such information facilitates understanding of the 3Rs among stakeholders, enhances self-awareness regarding their expected roles and acts as a bridge leading to concrete actions.
As the achievement of the 3Rs requires the partnership of various stakeholders from the product design stage through to the recycling/disposal stage, the sharing of information is vital to establish the mutual understanding and cooperation of various stakeholders. In the case of globally-distributed products (e.g., cell phones and personal computers), the sharing of information between exporting countries and importing countries is required for their proper recycling.

The following labels play an important role in facilitating information sharing among various stakeholders.

Labels indicating environmental friendliness of products

Ecomark | PC green label | Recycled paper

Labels indicating material type of recycling

Aluminum can | PET bottle | Paper container and packing | Plastic container and packing

PET

The following web page provides a database which can be used to search for information on various labels.
http://www.env.go.jp/policy/hozen/green/ecolabel/

The sharing of information on the outcomes of various efforts is also important.

In Japan, the White Paper on a Sound Material-Cycle Society is published every year, describing the efforts/approaches to create a sound material-cycle society and their achievements.

Incentives

Incentives for the promotion of the 3Rs can be classified into economic and social types. In addition, setting up of priority areas to facilitate the clustering of 3R-related businesses and providing business know-how are useful for the promotion of the 3Rs. In Japan, the Eco-Community project scheme, in which projects with excellent ideas and creativity act as model projects are invited to be implemented as demonstration projects, and the Eco-Town project scheme, aimed at creating towns which are in harmony with the environment, are promoted as part of the efforts to create a sound material-cycle society. Moreover, proper enforcement of regulations relating to the 3Rs and waste management can greatly help efforts to achieve the 3Rs by ensuring a level playing field for 3R-related businesses.

Economic Incentives

·Preferential taxation
·Low interest loans
·Subsidies
·Debt guarantee

Social Incentives

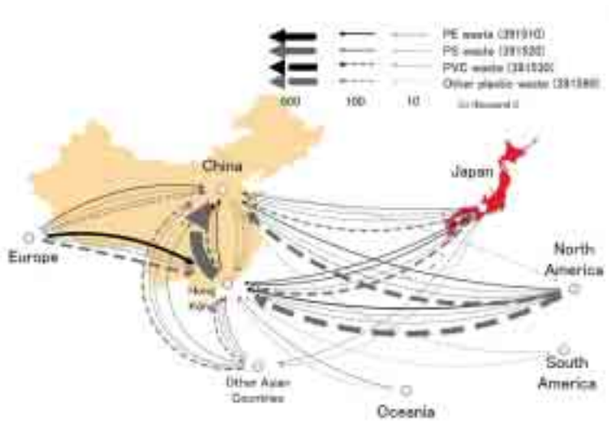
Explanatory meeting on food waste collection and composting at shopping streets (Eco-Community project)

Green purchasing awards ceremony

Technology Development

The promotion of science and technology suitable for the 3Rs has substantial potential to bring about sustainable production and consumption patterns. The promotion of research on a system which enables a material cycle at the local level, research to establish and evaluate the material flows, the development of clean technologies to promote the 3Rs at the production stage and technical development to promote the 3Rs at the design stage will be essential in the coming years. The provision of information on science and technology for the public and collaboration between universities/research organizations and local governments/communities are important to enable the introduction of science and technology which is rooted in local areas.

Research on identification and evaluation of regional material flow



Example of technology development for 3R promotion at the product design stage (Design for 3Rs)

parts made from recyclable polypropylene
reusable parts
bumper made from polypropylene which is reusable as parts or recyclable as resinous material
parts made from recyclable thermoplastic resin

Partnership

All stakeholders, including central government, local governments, private sector, communities and NGOs, are required to make efforts on their own initiative while being fully aware of their expected roles. A partnership approach with the cooperation of stakeholders is important. Cooperation between the private sector and the public sector will be particularly crucial in the coming years. Local governments are expected to not only initiate their own actions under the auspices of leadership by local administrative chief but also to play a coordinating role for the linkage among stakeholders.

Refining bio-diesel fuel from used cooking oil through cooperation between the local government and citizens (Kyoto-City)

In city of Kyoto, waste cooking oil collected from households is refined as bio-diesel fuel which is used by waste collection trucks and municipal buses. At present, approximately 120,000 litres of waste cooking oil are collected every year at approximately 800 collection points throughout the city.

Citizens collect used cooking oil.

The government of city of Kyoto refines the collected cooking oil to bio diesel and uses it as fuel for waste collection trucks.

Scholars and relevant business entities provide technical support for bio diesel.

International Cooperation for Promoting a Sound Material-Cycle Society

In many countries, economic growth and the progress of urbanization have resulted in an increased volume and diversification of wastes. With the further development of various means of transportation and volume conclusion of free trade agreements, it is anticipated that the transboundary movement of goods and services will continue to increase. It is necessary to further promote international cooperation regarding improved awareness of the 3Rs approaches and to accelerate the establishment of businesses to recycle resources in addition to develop schemes to implement policies and measures to realize the 3Rs and 3R-related technologies, systems and facilities. A regional approach should prove to be highly effective for this purpose.

Promoting 3Rs in Asia and in the World

Realization of Sustainable Society

Shift from Unsustainable Production and Consumption Patterns

Establishment of a Sound Material-Cycle Society in the Whole World

Establishment of a Sound Material-Cycle Society in Asia

First Priority:Waste Minimization through Promotion of 3Rs within a Country

Major Premise: Prevention of Environmental Pollution Accompanied by Transboundary Movements of Wastes

International Actions

Setting up of Frameworks	Setting up of a Vision and Rules	Creating Opportunities
Enhancement of policy-planning capacity of government staff Promotion of research and accumulation of knowledge Facility development	Formulation of regional vision for a sound material-cycle society Formulation of a national plan on promotion of a sound material-cycle society	Exchange of policy planners, creating opportunities for policy dialogues on a regional basis
Human resource development in science and technology/research Promotion of science and technology	Preparation of legal framework and plans for establishment of a sound material-cycle society Setting up, following-up and reviewing quantitative targets	Creating opportunities for cooperation among stakeholders coordinated by governments Creating opportunities for awareness-raising

Domestic Actions

Global Cooperation

The Ministry of the Environment, other relevant ministries, Japan International Cooperation Agency (JICA), related organizations, local governments and universities are working together to provide training courses for staff members of the central and local governments and others from developing countries on various issues, including the volume reduction, recycling and environmentally-sound management of waste.

Promotion of Policy Dialogues in Asia

ECO Asia
(Environment Congress for Asia and Pacific)

Tripartite Environment Ministers Meeting among China, Japan, and Korea

Asian Network for Prevention of Illegal Transboundary Movement of Hazardous Wastes

COLUMN

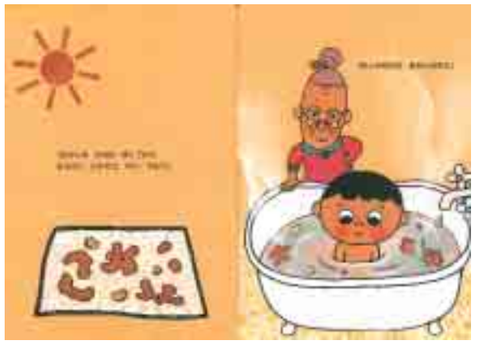
International Green Purchasing Network

In 1996, the Green Purchasing Network (GPN) was formed in Japan with the participation of businesses, administration and consumer organizations to facilitate efforts for green purchasing. The activities of the GPN include the promotion of green purchasing, the introduction and commendation of good practices, the formulation of purchasing guidelines and the development of a database on environmentally-sound products.

The Sendai Declaration on Green Purchasing which was announced at the 1st International Conference on Green Purchasing, held in Sendai in October, 2004, calls for the establishment of the International Green Purchasing Network (IGPN) to extend these efforts worldwide. In the coming years, the IGPN is expected to publicize the latest information and efforts regarding green purchasing in the world through its website and e-mail, to hold regular global conferences as well as regional workshops in Asia and other regions and to develop green purchasing guidelines which can be commonly used throughout the world.

Spirit for Promotion of the 3Rs: “mottainai”

The Japanese have an expression, “mottainai,” which means it is a shame for something to go to waste without having made use of its potential in full. This expression incorporates a respect for the environment that has been handed down from ages past. Based on this perspective, the Japanese people have aimed to lead their lives seeking simple but refined beauty, preferring tasteful quality over volume.



Courtesy of CABINET PUBLIC RELATIONS OFFICE

Japanese Prime Minister Koizumi shaking hands with Kenyan Deputy Environment Minister Maathai, the 2004 Nobel Peace Prize winner, who proposed global promotion of “mottainai” (February 2005)

The concept of “mottainai” has been passed on to children through picture books and the like. (by Mariko Shinju, Mottainai Ba-san (Grandmother), Kodansya Ltd, 2004)

One example is a square cloth called “furoshiki” which is used to wrap and carry goods. Furoshiki has no preference for the shape of an object which can be soft clothing, a rectangular box or a long narrow bottle. Furoshiki can be folded into a small size for ease of carrying when not in use and can be used repeatedly. In a way, furoshiki is the culmination of the wisdom and sense of beauty nurtured by the Japanese people throughout their history.

The origin of furoshiki is said to date as far back as the Nara Period (8th Century) although the name “furoshiki” began to be used in the early Edo Period (early 1600’s).

There must be many manifestations of the wisdom of generating as little waste as possible or of repeatedly using things with care in the world. The collaboration of the world’s people while offering their own wisdom will prove to be a major support for the creation of a sound material-cycle society on a global scale.

Acknowledgement

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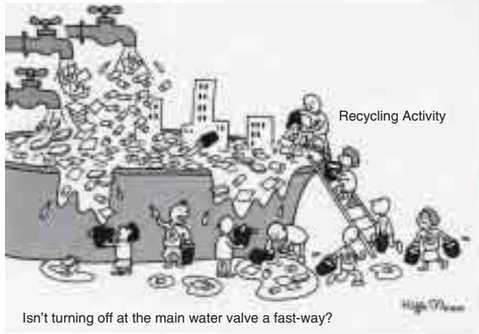
◇ **Hitoshi Terashima,** Director of Engineering Division, Japan Waste Management Association
◇ **Isamu Yokota,** Professor, Lab. of Environmental Policy, Grad. School of Nutritional and Environmental Sciences, University of Shizuoka

Alphabetical order, Titles and institutions as of March 2005

Photo Credit and Data Source

◇Aizuwakamatsu City ◇Arai Total Institution Co., Ltd. ◇ASAHI GLASS CO., LTD. ◇Association for Electric Home Appliances ◇Atsugi nakachou main street shopping mall promotion association ◇Bureau of Environment, Tokyo Metropolitan Government ◇CABINET PUBLIC RELATIONS OFFICE ◇Chubu Recycle Citizen’s Action Group for Waste Reduction ◇Environment Bureau, City of Fukuoka ◇Cooperative Network for Distribution of Returnable Bottles ◇The Council for PET Bottle Recycling ◇DAIKAN Co., Ltd. ◇Earth Life Network ◇Eco Wakayama Co., Ltd. ◇Environment Bureau, City of Kawasaki ◇Environment Bureau, City of Kitakyusyu ◇Environment Bureau, City of Kyoto Environmental Affairs Bureau, City of Sapporo ◇Faculty of Engineering, Fukuoka University ◇FUJITSU LIMITED ◇The Furoshiki Kenkyu Kai (The Furoshiki Study Group) ◇GLASS INDUSTRY CONFERENCE OF JAPAN ◇GomiZero Partnership Conference ◇Green Purchasing Network, Japan ◇Hitachi-Omron Terminal Solutions, Corp. ◇CHIHARA ECOCEMENT CORPORATION ◇Japan Environment Association ◇Japan Waste Management Association ◇JICA ◇Kanazawa City, Recycling Promotion Section ◇Kanazawa Ecolifekobo ◇Katsumura Construction Co., Ltd. ◇Kirin Beverage Corporation ◇Kitakyusyu ELV Co-operative Society ◇Kodansha Ltd. ◇Kojo Elementary School ◇Matsushita Electric Industrial Co., Ltd. Panasonic Center ◇The Minamata City Environmental Clean Center ◇Nakao Daisuke/SEKAI BUNKA PHOTO ◇National Institute for Environmental Studies ◇Nihon Keizai Shimbun, Inc. ◇Nishibata Elementary School ◇Nishinihon Kaden Recycle Corporation ◇Nissan Motor Co., Ltd. ◇ODAKYU Electric Railway Co., Ltd. ◇Osaka City Environmental Management Bureau ◇PC 3R Promotion Center ◇Saijo City ◇Seiko Instruments Inc. ◇The Seibu Department Stores, Ltd. ◇Sekisui Chemical Co., Ltd. ◇Telecommunications Carriers Association ◇Teshima Island Citizen’s Society Demanding for Recovery from Illegal Dumping of Industrial Waste



Isn’t turning off at the main water valve a fast-way?