

# **Fundamental Plan for Establishing a Sound Material-Cycle Society**

(Tentative Translation by Ministry of the Environment)

**Government of Japan**

**March 2003**

This Fundamental Plan is reported to the Diet based on the provisions of Article 15-6 of Fundamental Law for Establishing a Sound Material-Cycle Society (Law number 110 of the year 2000) as Fundamental Plan for Establishing a Sound Material-Cycle Society.

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Fundamental Plan for Establishing a Sound Material-Cycle Society<sup>1</sup> (hereinafter referred to as " Fundamental Plan ") was established based on the provisions of Article 15 of Fundamental Law for Establishing a Sound Material-Cycle Society. Fundamental Plan is also a programme of ten years for accelerating the changing unsustainable patterns of production and consumption, based on the Plan of Implementation of the World Summit on Sustainable Development in September 2002.

Today, the degree of international interdependence is extremely high even in various areas of daily life because of the globalization of economic activities. Therefore, we will communicate internationally and cooperate with the international community to establish a sound material-cycle society.

## Chapter 1. Present Situation and Problems

### Section 1. Present Situation

#### 1. Unsustainable Activity Patterns of the 20th Century

The activity patterns that mankind has developed to a high degree since the beginning of the 20th century, that is, economic and social activities based on mass production and mass consumption, have brought great benefits to us. On the other hand, however, they have also had an adverse affect that, as a mass disposal society, breaks the ring of material cycle and hampers the sound material cycle. For this reason, domestically a serious situation continues: an enormous amount, about 450 million tons, of waste is generated annually and, at the same time, the disposal of waste and the like<sup>2</sup> (including used goods and by-products as well as waste) is getting more difficult due to their diversity, an increase in environmental loads due to inappropriate management of waste and the like

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<sup>1</sup> A Recycling-based Society is a society with environmentally sound material cycle.

<sup>2</sup> The phrase "waste and the like" is defined by Fundamental Law for Establishing a Sound Material-Cycle Society to include used goods and by-products as well as waste.

has emerged as a problem, and there is a shortage of landfill capacity at final disposal sites - as for industrial waste, the remaining capacity is for four years for the whole country and only for one year in the metropolitan areas.

On the other hand, these activity patterns also generate environmental impact problems on a global scale, such as concern about the depletion of natural resources and the global warming problem. For mankind to continue such economic and social activities in the 21st century as well means that it would run into the limitation of the carrying capacity of the environment, and we could not hope for sustainable development.

## 2. Situation of Material Flow

An overview of the material balance of our country in the fiscal year 2000<sup>3</sup> indicates that, against the total material input of about 2.13 billion tons, about a third of that amount (about 710 million tons) was discharged to the environment in forms of waste or carbon dioxide. On the other hand, the amount of recycled materials was about 220 million tons, accounting for only 10 percent of the total material input.

In addition, there are "hidden flows" that are collected or exploited with the intended resources or discharged as waste in the course of resource extraction, and the like. There is estimation that they amount to 1.09 billion tons in this country (97percent of the about 1.12 billion of tons extracted resources) and 2.83 billion tons overseas (3.9times of the about 720 million tons of extracted resources), amounting to a total of 3.92 billion tons.

## 3. Providing the Legal Basis

To deal with such a situation, the idea of "a sound material-cycle society" was proposed, which intends sustainable development that integrates the environment and economy as the way that an economic society of the 21st century should be. And to clarify the process

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<sup>3</sup> A fiscal year is April to March in Japan.

for realization of this sound material-cycle society, Fundamental Law for Establishing a Sound Material-Cycle Society (Fundamental Law) was enacted in June 2000, the last year of the 20th century.

Moreover, in concert with Fundamental Law, the Waste Management and Public Cleansing Law (Waste Management Law) was amended, and the Law for the Promotion of Effective Utilization of Resources (revision of the Law for the Promotion of Utilization of Recycled Resources), the Law Concerning Recycling, etc. of Materials from Construction Work (Construction Waste Recycling Law), the Law Concerning the Promotion of Reuse, etc. of Food Cycle Resources (Food Waste Recycling Law), and the Law Concerning the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities (Green Purchasing Law) were approved. And, the Law Concerning Recycling Measures for End-of-life Vehicles (End-of-life Vehicle Recycling Law) was approved in July 2000. With these laws and existing laws, such as the Law Concerning the Promotion of Separate Collection and Recycling of Containers and Packages (Containers and Packaging Recycling Law) and the Law for Recycling of Specified Kinds of Home Appliances (Home Appliance Recycling Law), the legal basis for promoting efforts for establishing a sound material-cycle society is being provided.

#### 4. Improving Facilities

Facilities for the correct cyclical use<sup>4</sup> and disposal of waste and the like are essential for establishing a sound material-cycle society. For this purpose, municipal solid waste disposal facilities, industrial waste disposal facilities, waste water treatment plants including sewerage systems and septic tanks, and final disposal sites for general waste and industrial waste, are being improved.

In addition, efforts are being made for: quickly and accurately understanding information

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<sup>4</sup> The phrase “cyclical use” is defined by Fundamental Law for Establishing a Sound Material-Cycle Society to include reuse, recycling and heat recovery.

about waste and the like; preparing statistical information for analysis and publication; conducting research and promoting science and technology, ranging from material development and production processes to cyclical use and disposal, that contribute to the establishment of a sound material-cycle society.

#### 5. Promotion of Voluntary Activities of Citizens

Citizens and business organizations are expected to recognize that they generate waste and the like through their daily lifestyle or business activities, increase understanding of the responsibility they should bear and roles they can play, and promote concrete activities for establishing a sound material-cycle society. For this reason, efforts are being made for: promoting environmental education and environmental learning; information to promote private organizations' voluntary activities, such as the collection of garbage as a resource and the holding of flea markets; and fostering human resources, including staff of the State and local governments, who would contribute to establishing a sound material-cycle society. In addition, on the part of business organizations, their products are given consideration for a sound material-cycle society, and sound material-cycle society businesses (including waste disposal services, recycled resource distribution, recycled resource processing, reused product distribution, waste disposal equipment manufacture, and environmental consultancy) are being developed.

### Section 2. Problems

#### 1. Realization of Social and Economic Systems Based on Sound Material Cycle

In the present situation just described, we must make appropriate efforts to "reduce" the total material input, amount of extracted resources, generation of waste and the like and energy consumption, and "reuse" and "recycle" resources and products. Thus we must proceed with maximum effort aiming to restrict natural resource consumption and reduce environmental loads.

In particular, we must minimize the use of natural resources such as fossil fuels and mineral resources that are impossible to regenerate naturally, and promote the utilization of regenerated resources and biomass, an organic resource derived from regenerable organisms, and collected, or otherwise gathered, with appropriate consideration given to the environment so that its sustainable use is possible.

In addition, since the increase of energy necessary to use resources cyclically means the generation of a new environmental load, we must promote efficient use of the energy necessary for cyclical use and the utilization of renewable energy sources such as biomass. Moreover, we must prepare an efficient network distribution system.

As for hidden flows, we must try to reduce them by not extracting more resources than necessary or through the improvement of extraction methods.

## 2. Solution of Waste Problems

In recent years, with the amount of discharged waste remaining at a high level, problems have been incurred, including improper cyclical use and disposal, the shortage of landfill capacity of final disposal sites, frequent occurrence of illegal dumping, demand to establish methods for remediation, and so on. Solving these problems is a precondition for establishing a sound material-cycle society.

## Chapter 2. Image of a Sound Material-Cycle Society

Hereafter, efforts will be promoted to: expand the system based on the discharging person's responsibility and extended producer responsibility (EPR); prevent illegal dumping, establish a system to regulate it and restore the original state; appropriately utilize economic instruments to encourage self-managed actions of each entity; rationalize procedures of all sorts, and so on. Moreover, with the development of sound material-cycle society businesses, citizens, nonprofit organizations (NPOs), nongovernmental organizations (NGOs), business organizations and the like will work in cooperation with each other and play their respective roles, aiming high and actively making an effort to establish a sound material-cycle society.

With activities of these various entities being well conducted, by around the year 2010, a sound material-cycle society represented by the following image, for example, will be established, and the public at the present time and in the future will be able to enjoy healthy and cultured lifestyles.

### Section 1. Material Cycle in Nature and Material Cycle in Economic Society

We are going to realize recycling in an economic society, which will lead to the restoration of material cycle in nature.

The natural environment is formed on a delicate balance of the ecosystem where substances circulate through the air, water, soil, organisms and the like. We live in such an environment and extract resources from nature in large quantities, produce and consume various things in large quantities, and then afterwards discard disused things in nature in large quantities. To carry on a so-called mass-production, mass-consumption and mass-disposal society, imposes heavy loads on nature and, because of that, it is impossible for us to sustain our society this way.

In the sound material-cycle society that we are aiming at now, the following will be the fundamental principles: to reduce the amount of resources that are removed from nature as much as possible, and to reduce the amount of things that are finally discarded in nature as much as possible by inputting things once used in society as recycled resources.

Thus, we will build, with people of present and future generations, a society that respects material cycle in nature and imposes no excessive loads on nature. That is, a society that makes effective use of resources and attaches importance to quality, a society where people can enjoy abundant blessings of the environment.

## Section 2. Changes in Thoughts on Lifestyles and in Them

As to our lifestyles, one where we commune with nature close to us that has characteristics specific to our local area, use and utilize biomass and other renewable energies existing in our area, live together with nature and feel the changes of the seasons by, for example, tasting foods in their true season, a so-called "slow" lifestyle, will then take root. And the "one-way" lifestyle that was formed during the latter half of the 20th century will be replaced by one that is based on "material cycle".

For example, we will manage forests, a type of "nature" close to us, according to plans that include growing trees over a time span of 100 years. Also, we will use the cut down timber for housing and furniture, then as recycled wood particle boards and the like, and will finally utilize as fuel for heating and the like. In addition, "satoyama", a community-based forest, will be utilized as a site for observing nature and environmental education, through mushroom or edible wild plant gathering and the like.

As for food, products labeled with the name of the producer so that their "face" can be seen will be preferred and consumed. In an area where urban districts and cultivated fields exist together, products will be produced and consumed in the same area, and raw garbage will be utilized as compost or livestock feed, thus cooperation between food

consumers and producers in the area will be promoted.

As for objects, people will set a high value on using furniture and tools for many years, by polishing, repairing and mending them, using their own hands. And by the merits of making goods by one's own efforts, the enjoyment of one's own handiwork will be highly appreciated. Because people will have the thoughts that they will not do wasteful things and will use good things with care, the length of the replacement cycle of housing, furniture, electrical appliances or automobiles will be longer, and the proportion of long-life products that are designed to allow an extended period of use will be higher. Moreover, needs for services such as lease and rental services for people who are not particular about purchasing or possessing products, and the repair and maintenance services for people to use these products for a long period of time, will be increased.

As for household articles that are required to be replaced after a certain period of time or goods for children that are used only for a certain period of time, people will think that they only need to use the functions of these goods without having to possess them. They will actively use recycling shops, flea markets and the like, and consume wisely and rationally. Moreover, people will bring their own shopping bag or wrapping cloth when going shopping and refuse unnecessary containers or packages. They then will tend to purchase environmentally conscious products and services (green products and services), including recycled goods and refill products that impose smaller environmental loads (green purchasing).

As for services, people will have more opportunities to access art and culture, including concerts and theaters, and more people will participate in leisure activities such as sports and camping. They will enjoy eating foods more slowly, thus life will be enriched. While people will enjoy these various kinds of services, consideration to the environment will be incorporated into every service: reusable cups will be used in soccer and baseball stadiums and concert halls and the like instead of disposable containers, and efforts will be promoted to use and utilize raw garbage from hotels and restaurants as compost and/or

biogas.

### Section 3. Changes in Thoughts on Styles of Manufacturing and the like and in Them

As for manufacturing, the idea to perform frequent model changes and sell in large quantities will go out of fashion. The manufacturers will assume themselves to be and will be considered responsible for the disposal of used products as well. Services that are necessary to use products for a long period of time, including their repair, maintenance and functional upgrades and the like, will be increasingly provided for. In addition, more products will be taken back when they become unused. The thought that gaining trust from customers through these services is a desirable economic activity for both consumers and businesses in the long run will become more common. And, suppliers of goods will actively incorporate consumers' intentions for preservation of the environment into their products. They will provide green products and services that utilize new technologies and/or systems, and propose business models of that kind.

Because of the above, not only will the market of sound material-cycle society businesses be expanded domestically, but also the green products and services of our country will be highly appreciated internationally and will become a major export industry as well.

As for products, Design for Environment ( DfE) will be incorporated into them: products will be designed so that they allow their repair, maintenance and upgrade and, taking account of issues after they become unusable, they will be designed so that their correct reuse, recycling or disposal can be easily performed, if and when they become waste. Thus, manufacturers will develop and sell more refill products and long-life products, as well as products that use fewer resources, have more value added, and attach importance to functionality and design.

Also, manufacturers will minimize use of hazardous chemical substances in each of the stages, including material choice, processing, and assembly. Moreover, they will devise

good ways for price-setting and information provision of such products so that consumers are encouraged to use them.

As for services, ways of providing products other than selling them will be more common: lease and rental systems with a concept to provide functions, recycling shops that provide high-quality goods, and repair and maintenance services for customers to use good products with care for a long time.

As for business activities, efforts for the so-called 3 R's (reduce, reuse and recycle) will be actively developed in areas including production, sales of products, and provision of services. Production, recycling and disposal processes will be merged, and organic cooperation among industries and cooperation between industrial circles and communities will be promoted. Practices will be pursued to minimize raw material input and reuse and recycle waste and the like to the maximum in a factory as a whole. And "industrial symbiosis" will be advanced where, for example, waste and the like from an industry are used as raw materials for another industry. All these will result in the reduction of waste discharge. In the business activities in offices as well, in an effort to consider the environment, actions to reduce waste, energy use and the like will be further promoted. Practices utilized will include: photocopying on both sides of paper; use of green products and services; appropriate use of lighting apparatus and air conditioners; and the spread of telecommuting due to advances in information technologies.

#### Section 4. Promotion of Activities of Each Entity for Establishing a Sound Material-Cycle Society

For establishing a sound material-cycle society, the State, prefectural governments and municipalities will: enact laws and regulations and correctly enforce them, prepare facilities for cyclical use and disposal, and, at the same time, play the part of a coordinator promoting communication with entities, including citizens, and private and business organizations.

Citizens will realize that their lifestyles are imposing heavy environmental loads, and thus make efforts to change their lifestyles. This will include the sorting of waste and the like, the collection of waste and the like as a resource, and preferential purchase of green products and services. Also, citizens will actively participate in environment preservation activities: they will participate in and/or give assistance to activities of private organizations, including NPOs and NGOs, participate in resource collection and cleaning activities, flea markets and other environment related events, and use their community currency.

Activities of private organizations including NPOs and NGOs will become more vigorous, and these organizations will play a major role in the sound material-cycle society. Their activities will include: promoting reuse and recycling of waste and the like; promoting green purchasing; pushing environmental education and learning; and conducting nature conservation activities.

Business organizations will promote environmental operations through the introduction of environment management systems, or otherwise make efforts to give consideration to the environment in every aspect of business activities. They should actively participate in environment preservation activities, open their factories and offices to the public to offer places for providing environmental information and education for community residents, and make a contribution to the community as a member of the community. Also, sound material-cycle society businesses will be developed.

With these entities acting in partnership with each other, efforts will be promoted according to the characteristics of each community for establishing a sound material-cycle society. Then, beautiful streets, houses, landscapes, warm communities, and cultures original to each community, will be fostered.

Section 5. Enhancing Systems for the Correct Cyclical Use and Disposal of Waste and the

Like

Based on the preparation of laws, regulations and the like for the disposal and recycling of waste, comprehensive recycling facilities will be constructed or improved at key points that are correctly and systematically arranged around the whole country. They will be able to recycle and/or dispose of waste and the like, including containers, packages and home appliances more efficiently, using advanced technologies. On the other hand, biomass including raw garbage will be correctly recycled at small-scale recycling facilities or biomass utilization plants in local areas. Recycling facilities in these areas will be resource-producing centers in our society that generate and provide new resources, while businesses will actively use these resources and minimize the new extraction of resources from nature.

Moreover, waste disposal facilities will be enhanced and integrated, and will have longer lives. These facilities will promote reuse and recycling (material recycling) as much as possible, and will be given the function of heat recovery (thermal recycling) so that they can generate power, provide heat and the like during incineration. Hazardous waste, such as PCBs, that must be disposed of and require high-tech systems to do so will be safely and correctly disposed of in dedicated facilities.

Waste and the like will be transported with consideration to the environment. Railroad and vessel transportation will be used in addition to or combined with transportation by truck. For example, through the construction and improvement of ports as bases for comprehensive network distribution, a comprehensive network distribution system will be constructed centering around harbors.

As for final disposal sites, efforts will be made according to the actual conditions of each area. For example, large disposal sites will be constructed or improved, or waste buried in existing disposal sites will be recycled, and/or reduced in quantity, to increase the reclamation capacity and prolong the life of final disposal sites. In addition, these

facilities will be open to the public and actively utilized as places for environmental education and the like.

On the other hand, illegal dumping prevention and control systems will be established through the utilization of information technologies and the like, and in cooperation with the community and related agencies. As for past illegal dumping, remediation is essential as a major prerequisite for establishing a sound material-cycle society. This "negative inheritance" will be rectified in accordance with our program.

With appropriate management, to promote this flow of collection, transportation, recycling and disposal of waste and the like, information and human resource systems will be enhanced. For example, statistical information regarding waste disposal and recycling will be improved. And, there will be an information basis that can be shared by manufacturers in the arterial area and waste disposal and recycling businesses in the venous area.

### Chapter 3. Quantitative Targets for Establishing a Sound Material-Cycle Society

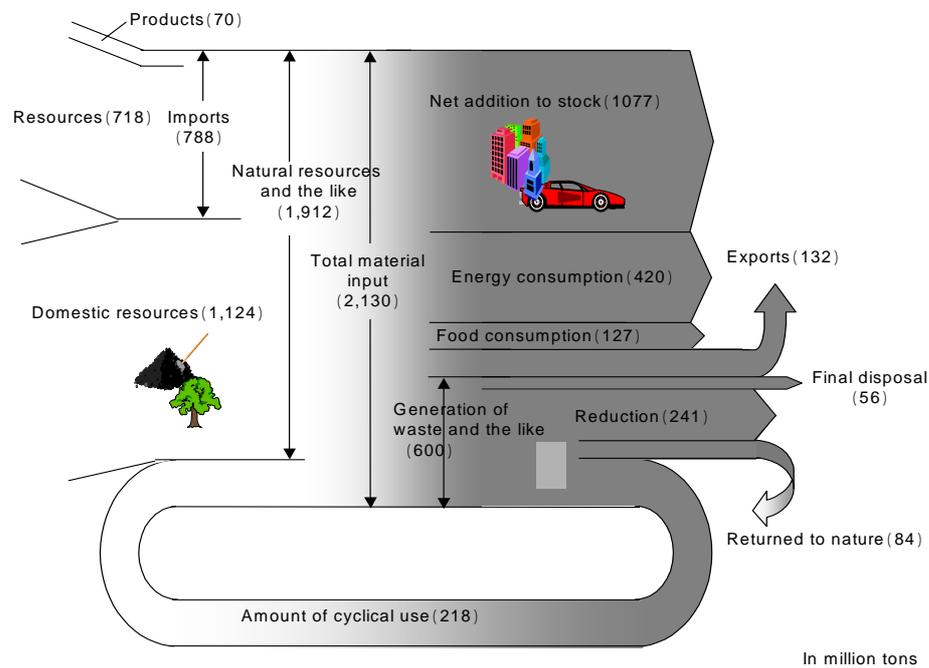
In order to establish a sound material-cycle society, the State, citizens, NPOs, NGOs, business organizations, local governments and the like will attain the following quantitative targets by making efforts described in the next chapters and below, including sound enforcement of relevant laws.

#### Section 1. Targets for Indicators Based on Material Flow Accounts

For establishing a sound material-cycle society, we set quantitative targets for indicators based on “material flow” accounts, which are used to understand the entire flow of materials in an economic society. More specifically, we set a target for each of three indicators that represent the three aspects of the material flows in our society .

And we set the fiscal year (FY) 2010 as a target, foreseeing society in around the FY 2020 with a longer perspective.

[Reference] Figure 1. Illustration of material flow in this country in the FY 2000  
(prepared by the Ministry of the Environment)

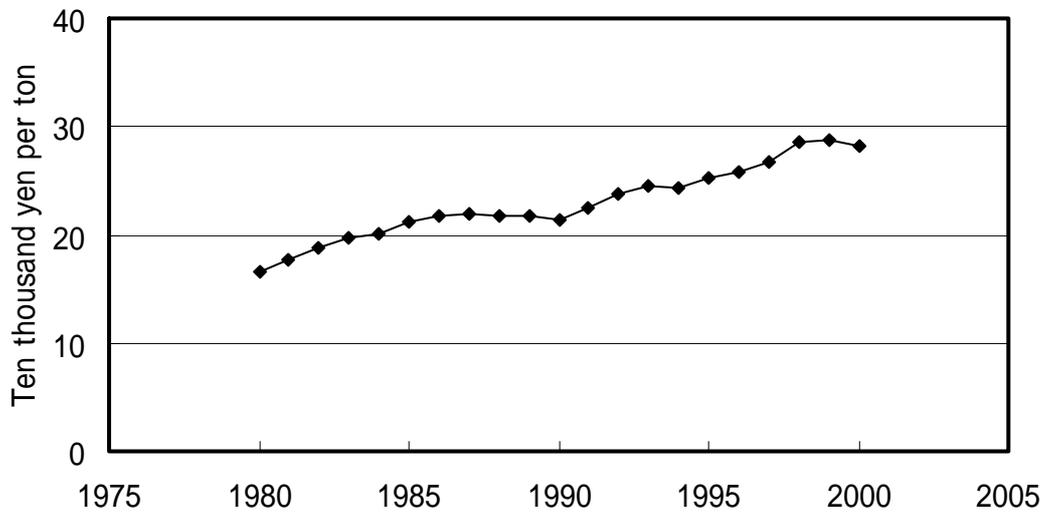


Note: The total amount on the output side is greater than the total material input due to the water included in waste and the like.

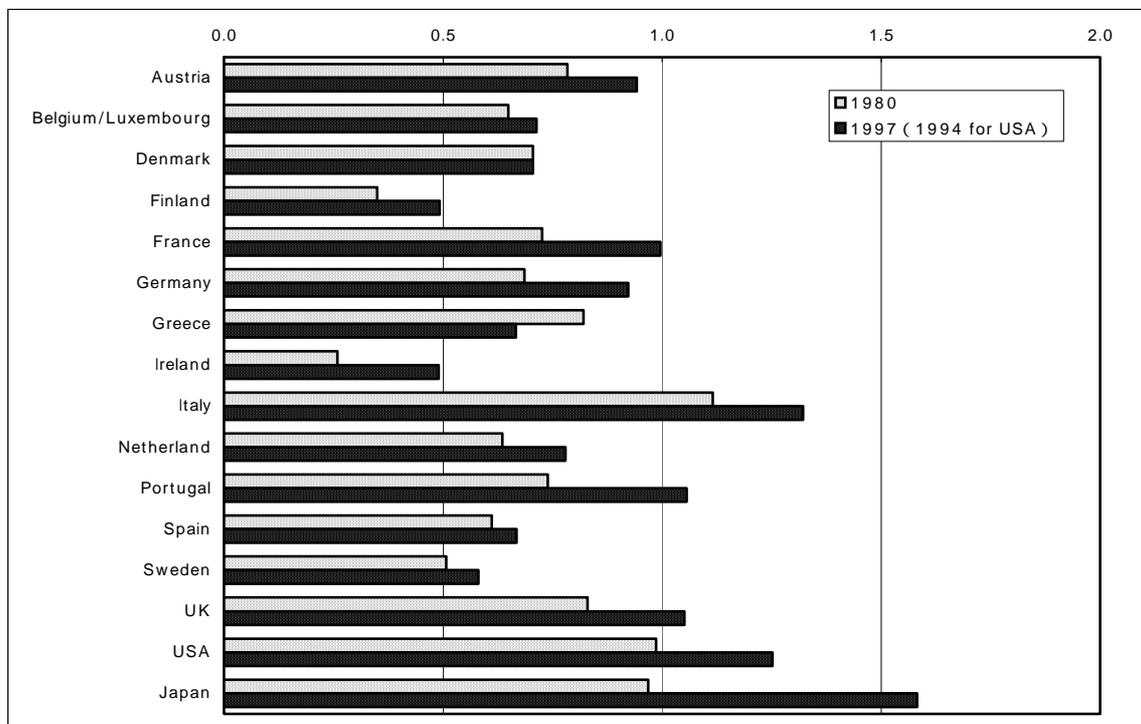
1. "Inlet": Resource Productivity (= GDP / Natural resources and the like input)

We set a target that the Resource Productivity should be about 390 thousand yen per ton in the FY 2010 (almost doubled that of about 210 thousand yen per ton in the FY 1990, and about a 40 percent improvement from about 280 thousand yen per ton in the FY 2000).

[Reference] Figure 2. Resource productivity in each fiscal year from 1980 to 2000 (estimated by the Ministry of the Environment)



[Reference] Figure 3. International comparison of resource productivity (US\$ 1,000/ton, based on purchasing power parity in 1995, estimated by the Ministry of the Environment using documents from the OECD, World Resources Institute (United States), and the like.)

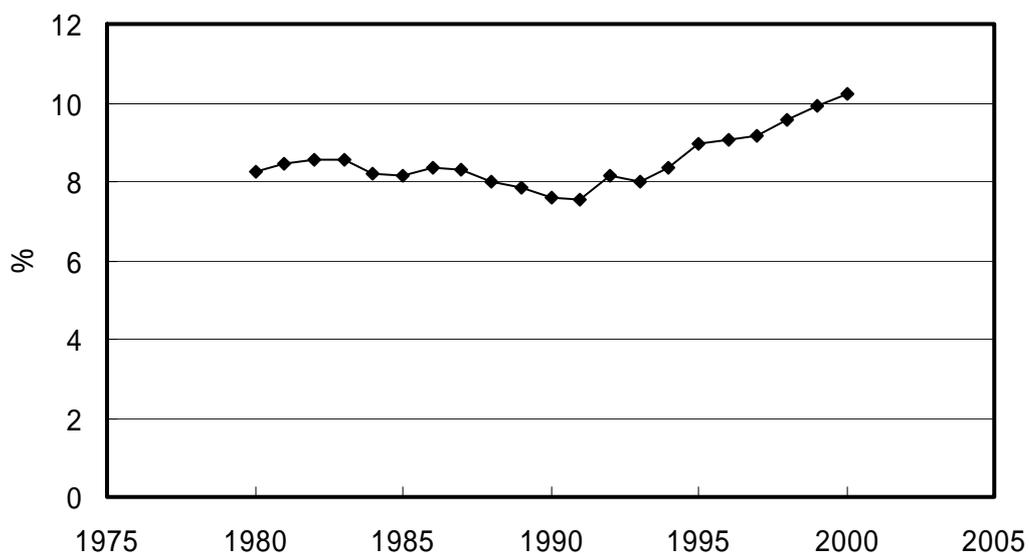


\* "Resource Productivity" is the index to comprehensively represent how effectively materials are used by industries and in people's lives. Natural resources and the like are limited in quantity, cause environmental loads when extracted, and finally become waste and the like. Therefore, it is desirable that the GDP is effectively generated with less natural resource and the like input. That is, an increase of resource productivity is desired. "Natural resources and the like input" indicates the amount of home-extracted and imported natural resources and imported products, and is also referred to as Direct Material Input (DMI).

2. "Cycle": Cyclical use Rate (= Amount of cyclical use/ Amount of cyclical use + natural resources and the like input)

We set a target that the Cyclical use Rate should be about 14 percent in the FY 2010 (almost 80 percent improvement from about 8 percent in the FY 1990, and almost 40 percent improvement from about 10 percent in the FY 2000).

[Reference] Figure 4. Cyclical use rate in each fiscal year from 1980 to 2000 (estimated by the Ministry of the Environment)



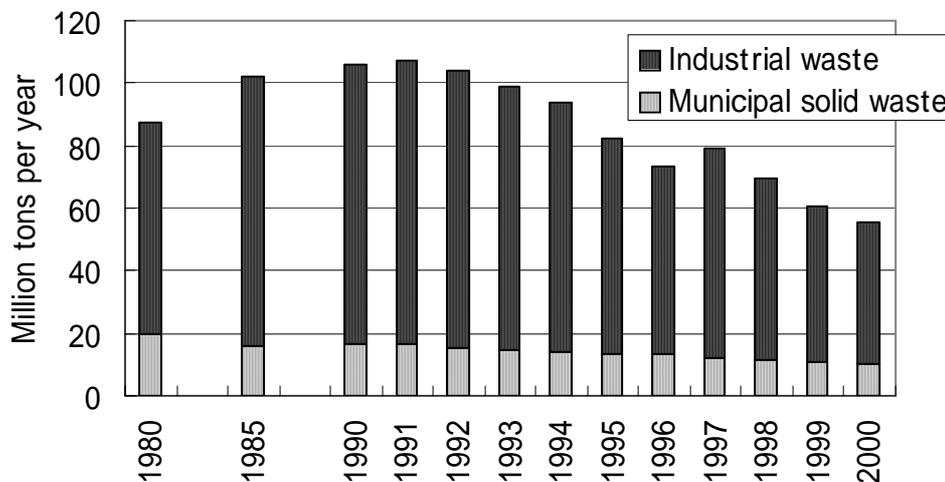
\* "Cyclical use Rate" is the index to represent the percentage of the amount of cyclical

use in the total amount of things input into an economic society. It is desirable, in principle, that this rate is increased, which means correct cyclical use is promoted to reduce the final disposal amount. The "total amount of things input into the economic society" is the sum of the natural resources and the like input and the amount of cyclical use.

### 3. "Outlet": Final Disposal Amount (= Final disposal amount of waste)

We set a target that the Final Disposal Amount should be about 28 million tons (almost 75 percent reduction from about 110 million tons in the year 1990, and almost 50 percent reduction from about 56 million tons in the year 2000).

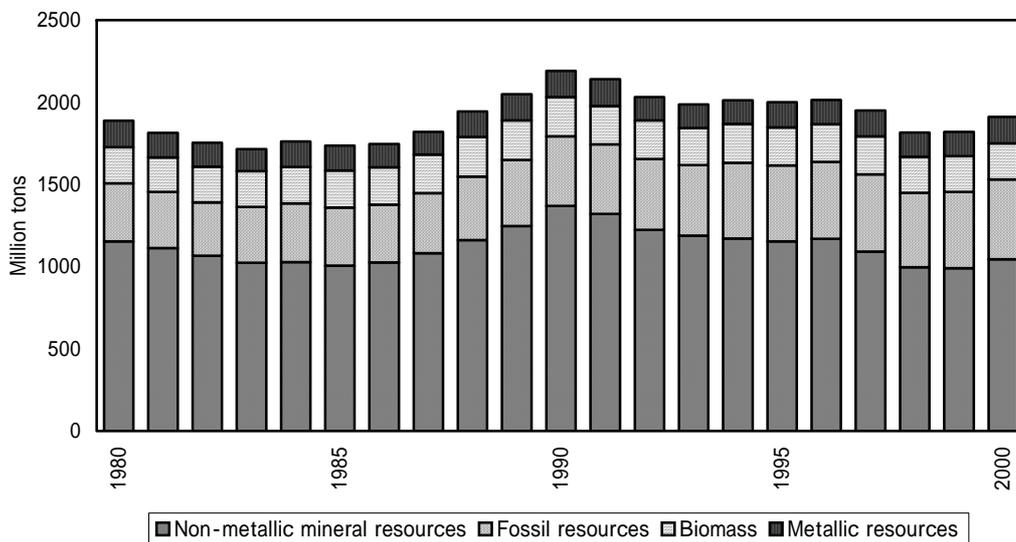
[Reference] Figure 5. Final disposal amount in each year from 1980 to 2000 (surveyed by the Ministry of the Environment)



\* "Final Disposal Amount" is the index that is directly connected to the urgent problem that the remaining capacity of final disposal sites is becoming very small. This index is represented as the sum of the final disposal amount of municipal solid waste and that of industrial waste, and it is desirable to decrease.

For direct material input, we make supplementary measurements by items (by resource types: fossil, metal, nonmetallic mineral or biomass, and domestically extracted or imported). The reasons for this include: an increase or decrease of nonmetallic mineral resources (earth and rocks) has a major impact on the whole; and it is desirable to use biomass that is extracted, or otherwise, with consideration to the environment so that its sustainable use is possible.

[Reference] Figure 6. Direct material input by resource types (estimated by the Ministry of the Environment)



Though it is also desirable to consider hidden flows, the amount of reuse, material flows by individual items, and indices regarding 3 R's with a common method of calculation, we do not have sufficient detailed data at this point in time. As a result, we will examine them in the future.

## Section 2. Targets Concerning Effort Indices

As indices to measure the progress of efforts for establishing a sound material-cycle society, we set targets concerning the following effort indices.

And we set the FY 2010 as the target.

1. Changes in Thoughts and Actions to Establishing a Sound Material-Cycle Society

(1) Thoughts and actions directed at waste

We set a target, as a result of a questionnaire, that 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.

[Reference: The Cabinet Office, "Public-opinion Survey: a Sound Material-Cycle Society" (2001, N (number of respondents) = 3,476)]

"I (always/sometimes) try to reduce garbage and recycle things": 71%

"Though I think the waste problem is serious, I buy a lot of things and dump a lot of things": 23%

"I (always/as much as possible/occasionally) try to buy environmentally-friendly products": 83%

"I do not try to buy environmentally-friendly products at all": 14%

[Reference] The Cabinet Office, " Public-opinion Survey: a Sound Material-Cycle Society " (2001, N = 3,476)

"I sort household garbage correctly and put it out at the designated place by type": 82%

"I wash bottles and the like to put out as garbage as a resource, so that they are easily recycled": 57%

"I usually use refill products": 47%

"I use something that has become unusable for another purpose, for example, make a dustcloths from old clothes": 40%

"I do not buy an unnecessary thing that seems like it will go out of fashion or lose its appeal soon": 37%

"I prefer products that are hard to break and last a long time": 34%

"For cooking, I try not to buy too much or cook too much, and make full use of leftovers to produce less raw garbage (eco cooking) ": 32%

"When doing shopping, I bring my own shopping bag or refuse excessive packaging": 29%

"I try to use things for a long time, mending them": 29%

"I compost raw garbage": 28%

"I try to buy as few as possible disposable products ": 23%

"I buy products that use returnable containers, such as bottled milk": 18%

"I actively buy recycled products made from regenerateable materials": 17%

"I give and take things no longer used to and from friends and acquaintances": 12%

"I am using a used article": 11%

"I sell things I no longer use at second hand shops, charity bazaars or flea markets": 10%

"I often use rental products": 5%

## 2. Reducing the Quantity of Waste

### (1) Reducing the quantity of municipal solid waste

We set a target to reduce the amount of garbage discharged from households per person per day (except that collected as resources) by 20 percent compared to the amount in the FY 2000. Also, we set a target to reduce the amount of garbage discharged from offices per day (except that collected as resources) by 20 percent compared to the amount in the FY 2000.

[Reference: Estimated from "Discharge and Disposal Situation of Municipal Solid Waste (Results in the FY 2000)" (the Ministry of the Environment)]

"The amount of garbage discharged from households per person per day": about 630 grams on average

"The amount of garbage discharged from offices per day": about 10 kilograms on

average.

## (2) Reducing the quantity of industrial waste

We set a target of reducing the final disposal amount of industrial waste by 75 percent compared to the amount in the FY 1990.

[Reference: The Ministry of the Environment, "Discharge and Disposal Situation of Industrial Waste (Results in the FY 2000)", Nippon Keidanren, or the Japan Business Federation, "Results of the 4th Follow-up to the Keidanren Voluntary Action Plan on the Environment (Measures against Waste)" (February 2002)]

"Final disposal amount of industrial waste in FY 1990": about 89 million tons

"Final disposal amount of industrial waste in FY 2000": about 45 million tons

In the voluntary action plan regarding the final disposal amount of industrial waste, formulated by Nippon Keidanren in December 1999, they put a target to reduce the amount in FY 2010 by 75 percent, comparing to FY 1990.

"Final disposal amount of industrial waste from the 28 business types of the Nippon Keidanren in FY 1990": about 61 million tons

"Final disposal amount of industrial waste from the 28 business types of the Nippon Keidanren in FY 2000": about 20 million tons.

## 3. Promoting Sound Material-Cycle Society Businesses

### (1) Promoting green purchasing

We set a target, as a result of a questionnaire, that about 50 percent of all the local governments and listed companies (companies listed in the first and second sections of the Tokyo, Osaka and Nagoya Stock Exchanges), and about 30 percent of the unlisted companies surveyed (unlisted companies and business offices with 500 employees or more), will implement organization-wide green purchasing.

[Reference: The Ministry of the Environment, "Questionnaire Survey on Green Purchasing" (2002, N = 2,144: prefectural governments and municipalities); the Ministry of the Environment, "Survey on Environmentally-friendly Actions of Companies in the FY 2001" (2002, N = 1,291: listed companies, N = 1,607: unlisted companies)]  
"Implementation rate of organization-wide green purchasing in the FY 2001"  
Local governments: about 24%, listed companies: about 15%, unlisted companies: about 12%

## (2) Promoting environmental business management

We set a target, as a result of a questionnaire, that about 50 percent of the listed companies and about 30 percent of the unlisted companies surveyed will publish an environmental report and conduct environmental accounting.

[Reference: The Ministry of the Environment, "Survey on Environmentally-friendly Actions of Companies in the FY 2001" (2000, N = 1,291: listed companies, N = 1,607: unlisted companies)]  
"Publication rate of environmental reports in the FY 2001"  
Listed companies: about 30%, unlisted companies: about 12%  
"Implementation rate of environmental accounting in the FY 2001"  
Listed companies: about 23%, unlisted companies: about 12%.

## (3) Expanding sound material-cycle society business market

We set a target that the market size and employment size of sound material-cycle society businesses should be doubled compared to that of the year 1997.

[Reference: "White Paper on a Sound Material-Cycle Society, 2002"]

"The market size of sound material-cycle society businesses in the year 1997": about 12 trillion yen

"The employment size of sound material-cycle society businesses in the year 1997": about 320 thousand employees.

For individual items and business types, the targets that are set based on their respective recycling laws, programs, and the like should be achieved.

## Chapter 4. Efforts of the State

Regarding the establishment of a sound material-cycle society, the State formulates Fundamental Plan and, while fostering a partnership with citizens, NPOs, NGOs, business organizations, local governments and the like, the State will comprehensively promote its efforts for the whole nation, including the sound enforcement of relevant laws. Also, the State will form the basis of actions for each entity through appropriate utilization of various policy instruments, including support for activities of each entity, and collecting and providing information for establishing a sound material-cycle society. Moreover, as a business entity and a consumer itself, the State will take the lead in conducting activities for establishing a sound material-cycle society.

More specifically, the State will promote efforts as follows:

### Section 1. Securing Material Cycle in Nature

To secure material cycle in nature, the State will restrict the use of natural resources such as fossil fuels and mineral resources that are impossible to regenerate in nature, and promote the utilization of recycled resources and biomass that is collected, or otherwise, with correct consideration given to the environment so that its sustainable use is possible. Moreover, the State will actively use and utilize renewable energy supplies such as biomass, and adopt measures to preserve the natural environment, including forest maintenance. For the effective utilization of biomass, the State will promote the sound implementation of the Comprehensive Biomass Nippon Strategy (endorsed by the Cabinet on December 27, 2002).

### Section 2. Changing Lifestyles

To steadily promote the establishment of a sound material-cycle society, the State will promote environmental education, environmental learning and the like in a

comprehensive manner, for all age groups from children to elderly people, at various places, including schools, community centers, homes, workplaces, and places for outdoor activities, and in cooperation with the people concerned.

Also, the State will assist citizens, NPOs, NGOs, business organizations and the like in promoting reuse and recycling activities, including the spread of lease and rental systems, the use of recycling and repair shops, carrying an eco-bag (one's own shopping bag), and the collection of waste and the like by, for example, providing necessary information.

When providing such information, in order to promote the enlightenment of a wide group of people, the State will consider conducting a variety of intensive publicity campaigns, or utilizing various media, including mass media, in cooperation with private organizations, including NPOs and NGOs.

### Section 3. Promoting Sound Material-Cycle Society Businesses

To actively promote the establishment of a sound material-cycle society, the State, as a business entity and consumer itself, will practice green purchasing. At the same time, the State will promote efforts so that each entity will actively use recycled products and other green products, green services, and natural energy supplies, so that a sound material-cycle society business market will be developed. For example, it will provide information regarding environment labeling, and green products and services, and promote the standardization of evaluation criteria and test/valuation methods for quality and safety of recycled products and the like. Moreover, the State will examine the effectiveness of economic instruments such as taxes, surcharges, deposit systems, unit-based pricing and the like to encourage each entity to voluntarily practice green purchasing, and facilitate appropriate expense distribution based on the market mechanism.

Furthermore, the State will try to rationalize the processes of collection, transport and disposal and the like of waste, and fully enforce the laws and regulations for promoting

sound material-cycle society businesses. Also, it will encourage business organizations, including smaller businesses, to make voluntary efforts to implement an environment management system, and prepare and publish environmental reports and environmental accounting, to ensure that environmental considerations are incorporated into business activities.

As for waste disposers, that should form one of the pillars for establishing a sound material-cycle society, the opacity of their market and improper actions, such as illegal dumping, by some of them are hurting the image of the industry as a whole. Taking such a situation into account, the State will consider, or otherwise, clarification and collection of the cost required for correct cyclical use and disposal, introduction of a company rating system using an independent commission, commendation of the best companies, and investigation of actively opening good plants, as a place for environmental education for communities or schools, to show examples of good business activities.

At the same time, making the most of the characteristics of each region, the State will try to foster so-called community businesses that conduct profit-making, continuous recycling activities. That includes the activity to collect and process raw garbage and waste oil to make fertilizer and livestock feed, conducted by private organizations or municipalities.

As for science and technology that contribute to the establishment of a sound material-cycle society, the State will promote product design and manufacturing systems that help restrict waste generation in manufacturing processes, and facilitate the cyclical use of collected waste and the like. It will also promote green industries, including the development of materials that impose smaller environmental loads. At the same time, the State will try to collect, arrange and provide technical information and product information, such as life cycle assessment (LCA), to encourage the development and diffusion of technologies. With this view, with the cooperation among academic, business, and government circles, the State will take appropriate measures to: establish systems for

experimentation and research; promote research and development according to industry needs, and diffuse the fruits of their work; build a third-party evaluation system for environmental preservation effects and the like of environmental technologies; train researchers and engineers to secure highly professional and wide-ranging human resources regarding environmental technologies; and provide technical guidance to business organizations, including smaller businesses.

Moreover, the State will take financial, technical, and other supportive measures as to equipment investment for the correct cyclical use and disposal of waste and the like.

#### Section 4. Realization of Safe and Secure Cyclical use and Disposal of Waste

To promote the correct cyclical use and disposal of waste and the like, the State will promote: (1) restricting generation, (2) reuse, (3) regeneration, (4) heat recovery, and (5) the correct disposal of waste and the like, based on the order of priority prescribed in Fundamental Law. (However, we will select another way that does not follow this order, if it is more appropriate because it would impose a smaller environmental load. We do not necessarily need to follow this order of priority.) As for reducing environmental loads that result from the disposal of waste, the State will further take specific measures according to the characteristics of each product, based on the idea that the dischargers, including businesses and citizens, have the primary responsibility for its disposal, or the idea of extended producer responsibility (EPR) that the producers and the like of products bear a certain responsibility at all stages, including after the use of those products. Specifically, the State will encourage the voluntary efforts of product manufacturers and the like to reduce the use of hazardous substances in their manufacturing processes and their products, and establish a mechanism for the correct collection, recycling and disposal of hazardous substances. Moreover, the State will conduct hazard assessment of waste and the like, research the impact of cyclical use and the disposal of waste and the like on the environment, and develop and diffuse correct disposal technologies.

Waste and the like that is generated by construction work accounts for a large proportion of the entire industrial waste amount generated and the final disposal amount. Therefore, based on the relevant laws, the Government's guidelines and the like, the State will promote the recycling of such waste, and encourage the use of recycled materials in public works projects and the like, thus steadily advancing its efforts for establishing a sound material-cycle society.

On the other hand, to prevent and remove hindrances to environmental preservation due to cyclical use and the disposal of waste and the like, the State will try to prevent illegal disposal through various measures. These include computerization of the control manifest system, a system to determine that the waste has been correctly transported and disposed of, and monitoring and regulation to deter illegal acts, including improper disposal. And, in the event that illegal disposal occurs, the State will try to facilitate appropriate and prompt remediation.

As for international cyclical use resulting from economic globalization, there is growing international concern about the fact that the export of waste and the like to countries that do not have adequate environmental regulations results in the destruction of the environment in those countries. Taking this into account, the State will promote efforts to manage hazardous waste with consideration to the environment according to the Basel Convention. Also, the State will try to comprehend the actual conditions of each country, provide a waste disposal/recycling system based on that of our country according to such conditions, and bring in trainees from those countries. And, it will investigate an efficient international distribution network, including the integration of exporting ports.

In addition, the State will examine measures to prevent garbage from being scattered in each region, and conduct necessary enlightenment activities and the like.

Section 5. Establishing the Basis for Supporting a Sound Material-Cycle Society

To establish a sound material-cycle society, it is essential to have suitable facilities for cyclical use and the disposal of waste and the like. The State will promote the construction and improvement of these facilities, paying attention to securing an adequate recycling capability and appropriate arrangement of them, using various policy instruments. These include support for technological development, economic furtherance, and the provision of public services by private initiative, that is, private finance initiative (PFI).

To ensure correct disposal, the State will continue to prepare final disposal sites, promote communal disposal among local governments, and facilitate cross-boundary, wide-area measures according to each prefecture in the metropolitan area. As for final disposal sites for industrial waste, the idea of the responsibility remaining with the discharger will continue to be the main principle. However, if necessary to adequately ensure the correct disposal of industrial waste, the State will promote the establishment of industrial waste disposal facilities by the public sector so that safe and appropriate final disposal facilities are ensured.

When constructing or improving these facilities, the State will actively promote the disclosure of information and dialogue with local residents, and proceed with the work after giving adequate consideration to the environment.

As for distribution concerning reuse and recycling, considering matters such as the reduction of environmental loads, the State will promote the establishment of an efficient distribution network, which utilizes railroad and/or sea transportation for medium and long distances, in appropriate combination with truck transportation.

On the other hand, the State will collect accurate information about the amount of generated waste and the like, the situation of cyclical use and disposal, the future outlook of the above, technical data about the material, composition, and design and the like of waste, and so on, and the environmental impact of cyclical use and the disposal of waste

and the like. And, the State will conduct accurate analysis of such information, and help the various entities to quickly and appropriately obtain, use and exchange such information, through the utilization of information technologies and the like.

Moreover, the State will promote people-to-people exchange and information sharing among academic, business, governmental, and private circles, including business organizations, universities, research institutes, the State, local governments, NPOs, and NGOs, in order to enhance human resources in regards to quality and quantity. Also, the State will enhance the service training system for staff of the State and local governments and teachers and other instructors concerned with environmental education and environmental learning, in order to improve their quality.

In addition, efforts in local areas are important for establishing a sound material-cycle society, and local governments should play a big role in such efforts. Therefore, the State will give the financial and technical assistance required for such local governments to take relevant measures. Also, since collaborative efforts among various entities including NPOs and NGOs in local areas are important from the standpoint of the community establishing a sound material-cycle society, the State will endeavor to build the basis for such efforts, and support ground breaking efforts.

## Chapter 5. Roles to be Played by the Entities

All the entities, including citizens, NPOs, NGOs, business organizations, local governments (prefectural governments and municipalities), and the State, must steadily take various measures for establishing a sound material-cycle society. In doing so, they should communicate with each other, actively participate in relevant activities, appropriately share burdens, and bear costs fairly and impartially.

More specifically, they will promote efforts as follows:

### Section 1. Citizens

Citizens are expected to realize that they are, as consumers and community residents, themselves dischargers of waste and the like, conduct themselves accordingly, and further proceed with changing their lifestyle for establishing a sound material-cycle society.

Specifically, environmental loads resulting from daily life should be reduced by their efforts to: refraining from using disposable products, refusing excessive packaging, promoting simple packaging, using "eco-bags", selecting green products and services that impose smaller environmental loads (preferentially purchase recycled products and refill products, and using rental and leasing services), cooperate in sorting collected waste to reduce its quantity and recycling, using bicycles or public transportation, using and utilizing biomass, and so on. Also, their efforts to create interest in the environment in their area, and participate or cooperate in environmental education, environmental learning, and activities for environmental preservation, should help establish a sound material-cycle society in their community.

### Section 2. NPOs and NGOs

NPOs and NGOs themselves are expected to conduct activities that contribute to

establishing a sound material-cycle society so that their social reliability is enhanced, and to coordinate environment preservation activities by various entities.

Specifically, they are expected to perform the following: activities for preserving the environment of local areas, such as the promotion of the 3 R's, 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; and sustainable and expandable activities as community businesses.

### Section 3. Business Organizations

Business organizations are expected to conduct business activities with consideration given to the environment, to further promote efforts for correct cyclical use and the disposal of waste and the like, build a network with consumers, and to disclose related information, based on the rules of discharger's responsibility and extended producer responsibility.

Specifically, they are expected to: restrict the production and distribution of disposable products, refrain from using excessive packaging, promote simple packaging, reduce the number of plastic bags to given to the shoppers, extend the life of products, use materials, products and services, such as recycled resources, that contribute to reducing environmental loads, take back products no longer used whose correct disposal is difficult or value as a resource is high, practice correct cyclical use and disposal, make more efficient use of resources and energy, so that environmental loads resulting from their business activities will be reduced. As for products, they will be developed with consideration given to environmental loads at various stages, including resource extraction, production, distribution, consumption and disposal, through life cycle assessment (LCA) and the like, so that environmental loads at every stage will be reduced. Also, efforts will be made to diffuse green products and services by cutting costs and

developing, manufacturing and distributing attractive products that reflect the taste of consumers in regards to quality, design and the like. Moreover, efforts will be promoted to: provide consumers with information about environmental loads regarding products and services through environmental labeling and the like; disclose and provide information about environmental loads regarding their business activities and their efforts to reduce them through the preparation and publication of environmental reports and the like; and contrive an assortment and display of green products and services when selling them.

Among business organizations, waste disposers have an extremely important role to play in establishing a sound material-cycle society. They should ask for the cooperation of dischargers of waste and so on and promote correct cyclical use and disposal of waste and the like, so that environmental loads resulting from their business activities will be reduced.

#### Section 4. Local Governments

For the establishment of a sound material-cycle society, which is one of the important issues in promoting community forming, local governments are expected to soundly enforce laws and regulations that are suitable for the natural and social conditions of each local area, conduct correct cyclical use and disposal of waste and the like. And, they are also expected to play the role of coordinator among various entities.

Specifically, local governments will make efforts in community making, including sorted collection and appropriate management of waste as a matter of course, promotion of the 3 R's through appropriate utilization of economic techniques as necessary, and improvement of public utilities such as waste disposal facilities, so that environmental loads will be reduced. Moreover, assuming the role as a coordinator and main animator of the efforts of the community, local governments will cooperate with business and private organizations, including NPOs and NGOs, to assist local residents to change their

lifestyles, recommend environment conscious green products and services or products made in the local area, and provide information about them. Local governments will promote these and other measures, comprehensively and systematically, according to the characteristics of each area, to establish a sound material-cycle society.

Furthermore, as they themselves are a business organization, local governments will take the initiative in green purchasing, implementation of an environment management system, and other actions for establishing a sound material-cycle society. And, they will formulate the fundamental plan to promote the establishment of a sound material-cycle society in the local area, based on Fundamental Plan.

## Chapter 6. Effective Execution of the Plan

### Section 1. Progress Evaluation and Examination at the Central Environment Council

To ensure the steady implementation of Fundamental Plan, the Central Environment Council will ask for the opinions of people from all quarters and all walks of life. They will take into account the results of independent examinations by related ministries, annually examine the progress of measures being made based on Fundamental Plan, trying to coordinate the work with the examination of Fundamental Environment Plan, and advise the Government, as necessary, about the direction in which its policies should go thereafter. The results of the examination by the Central Environment Council will be reflected in documents, including the annual report (the Annual Reports for Establishing a Sound Material-Cycle Society) that is to be annually reported to the Diet.

In addition, Fundamental Plan shall, in about five years, be reviewed, corresponding flexibly and appropriately to changes in both domestic and international societies and economies.

### Section 2. Cooperation among Related Ministries

The Government will promote close cooperation among related ministries through Cabinet conferences, related ministerial meetings, liaison conferences of related ministries and the like, and comprehensively and systematically execute measures regarding the establishment of a sound material-cycle society that are mentioned in Fundamental Plan.

The Government will formulate and promote Governmental plans other than Fundamental Environment Plan following the fundamental direction of Fundamental Plan, for the establishment of a sound material-cycle society.

In particular, it will promote organic collaboration between fundamental plan and other measures that are closely related to the establishment of a sound material-cycle society, including measures to prevent global warming and measures for material cycle in nature.

### Section 3. Establishment of the Progress Schedule for Executing the Individual Laws and Measures

Hereafter, the Government will promote efforts to enforce the laws and execute the measures for establishing a sound material-cycle society, according to the progress schedule shown in the appendix.

(Appendix) Progress Schedule for Executing the Individual Laws and Measures

FY	2001-2002	2003	2004	2005	2006	2007	2008-
Fundamental Law for Establishing a Sound Material-Cycle Society	Formulate Fundamental Plan	Follow-up to Fundamental Plan				Review of Fundamental Plan	
	Submit annual reports (Annual Reports for Establishing a Sound Material-Cycle Society) to the Diet, and making announcements						
	Promote efforts for establishing a sound material-cycle society, e.g. practicing a business model to help change lifestyles or the way of conducting business (re-style), conducting environmental education, diffusion and enlightenment activities (including providing information through administration briefs, brochures, the Internet and the like).						
Waste management and recycling laws	Try to soundly enforce the laws, examine the situation of their enforcement, and take necessary measures based on the examination						
Waste Management Law	Review and amend the law to further the promotion of correct management, such as recycling, and the prevention of improper management (FY 2002-)				Review the target amount of waste reduction		Evaluate and examine the law (by around the end of FY 2011)
Law for Promotion of Effective Utilization of Resources	Put the law into force (April 2001)						Evaluate and examine the law (by around the end of FY 2008)
Containers and Packaging Recycling Law				Evaluate and examine the law			
Home Appliance Recycling Law	Put the law into force (April 2001)				Evaluate and examine the law		
Food Waste Recycling Law	Put the law into force (May 2001)				Evaluate and examine the law		
Construction Waste Recycling Law	Put the law into force (May 2002)					Evaluate and examine the law	
Out-of-service Vehicle Recycling Law			Put the law into force (around the end of 2004)				Evaluate and examine the law (by around the end of FY 2009)
Law Concerning Special Measure against PCB Waste	Put the law into force (July 2001)				Establish a nationwide system to dispose of PCB waste (around 2006)		Evaluate and examine the law (by around the end of FY 2011) Complete the disposal of PCB waste (FY 2016)
Green Purchasing Law	Put the law into force (April 2001)						
	Try to soundly enforce the law. Review the specific items to procure, of which the State and the like should preponderantly promote the procurement, according to the situation of development and diffusion of green products and services and the expansion of scientific knowledge						
	Examine the way that the information providing system regarding green products and services should be structured, including the contents of such information, methods to provide it, and measures to ensure the provision of appropriate information, and take necessary actions based on the results of the examination (by around the end of FY 2007)						

Waste/recycling measures for important individual items	For biodiesel fuel and the like made from food waste and so on, conduct quality evaluation, safety and environmental impact evaluation, and automobile driving test (FY 2002 onwards)						
	Examine measures for recycling FRP ships (2002-)						
	Formulate the Construction Waste Recycling Promotion Plan 2002 (May 2002) Promote 3 R's for construction waste based on the plan						
Illegal dumping and remediation measures	Examine measures for remediation of illegal dumpsites and enact them into law (FY 2002)						Clear all the illegal dumpsites created before and in 1997, and conduct remediation (FY 2012)
Preparation of final disposal sites for industrial waste							Ensure capacity for about 5 years for final disposal amount (FY 2010)
Technological development	Conduct the Research Initiative for Zero Waste and Resource Sound Material-Cycle Technologies (FY 2002 onwards)						
Others	Implement the Comprehensive Biomass Nippon Strategy (endorsed by the Cabinet in December 2002) that has the objective to use or utilize 80% or more of waste-derived biomass, calculated in terms of the carbon amount (FY 2010)						
	Put into full force the Special Measures Law Concerning the Use of New Energy supplies and the like by Electric Utilities for promoting diffusion of new energy supplies (April 2003)						
	Build a venous distribution network (implement the New Comprehensive Distribution Policy Outline endorsed by the Cabinet in July 2001) Understand the actual conditions of recycling bases and transportation, research the formation of an efficient venous distribution network, and materialize one						
	Implement measures against global warming to fulfill the 6% reduction commitment made in the Kyoto Protocol (step 1)			Implement measures against global warming to fulfill the 6% reduction commitment made in the Kyoto Protocol (step 2)			The first commitment period of the Kyoto Protocol (FY 2008-2012).