

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

May 2013

This fundamental plan is reported to the Diet in accordance to Article 15 Provision 6 of the Fundamental Law for Establishing a Sound Material-Cycle Society (Law number 110 of the year 2000), which will be applied mutatis mutandis to Article 15 Provision 7 of the same law.

Fundamental Plan for Establishing a Sound Material-Cycle Society

Foreword.....	1
Chapter 1 Present Situation and Problems	3
Section 1 Present Situation	3
Section 2 Issues to be addressed	8
Chapter 2 Medium to long term direction of efforts toward establishing a sound material-cycle society	15
Section 1 A society where circulation in the natural world harmonizes with that in the economic society	15
Section 2 3R-oriented lifestyle and the establishment of local recycling zones	15
Section 3 Developing a social and economic system with high resource efficiency	17
Section 4 Assuring safety and security.....	18
Section 5 International efforts	18
Chapter 3 Indicators and numerical targets for establishment of a sound material-cycle society	20
Section 1 Material flow indicators.....	23
1 Indicators intended to set targets	23
2 Supplementary indicators intended to set targets / indicators to monitor developments...	26
(1) Inlet	26
(2) Circulation.....	28
(3) Others	29
Section 2 Effort indicators.....	29
1 Inlet	29
2 Circulation	31
3 Outlet	32
4 Others.....	32
Section 3 Agendas for the future	35
Chapter 4 Cooperation amongst entities and their expected roles	37
Section 1 Cooperation amongst entities	37
Section 2 Expected roles of entities	37
Chapter 5 State initiatives	41
Section 1 Basic direction of initiatives.....	41
Section 2 Domestic efforts	42
1 Establishing a sound material-cycle society with an eye on “quality”	42
(1) Establishing a social and economic system where 2R efforts can be encouraged.....	42

(2) Collection of useful metals from end of life products	43
(3) Promotion of advanced recycling such as horizontal recycling.....	44
(4) Development of appropriate treatment system for waste including hazardous substances	45
(5) Bolstering the waste disposal system at disaster times	47
2 Integrated efforts for establishing a low-carbon society and a harmonious co-existence society	48
3 Advancement of local recycling zones	49
4 Using circulative resources and biomass resources as energy source	51
5 Development of the recycling industry	52
(1) Development of quality business operators that seek effective utilization of waste etc	52
(2) Establishment of venous logistics systems	53
6 Appropriate disposal of waste	54
(1) Measures against illegal dumping and inappropriate disposal	54
(2) Securing of final disposal sites etc	55
7 Responses to individual laws	56
8 Promotion of environmental education, accurate information sharing and dissemination and awareness raising	59
(1) Promotion of environmental education	59
(2) Information sharing, dissemination and awareness raising on the 3Rs	59
Section 3 Promoting international efforts.....	61
1 Promotion of 3R international cooperation and support of overseas operation by Japanese recycling industry	61
2 Responses to exports and imports of circulative resources	63
Section 4 Response to the Great East Japan Earthquake	64
1 Disposal of disaster waste.....	64
2 Disposal of radiation contaminated waste	65
 Chapter 6 Effective implementation of this Plan	 66
Section 1 Cooperation amongst responsible government departments	66
Section 2 Evaluation and review of progress at the Central Environmental Council	66
Section 3 Schedule towards the achievement of individual laws and individual measures (schedule)	66

Foreword

Today, conservation of the environment has become a highly important issue that relates to the very foundation of the survival of the human race. Mass-production and mass-consumption style social and economic activities form a mass-disposal style society, which has an aspect that inhibits environmental conservation as well as sound material cycles. It is also deeply connected to global warming as a result of greenhouse effect gas emission, concerns on the depletion of natural resources, destruction of nature from large-scale extraction of resources, and other environmental issues.

Japan has developed a Fundamental Plan for Establishing a Sound Material-Cycle Society, based on the Basic Act for Establishing a Sound Material-Cycle Society (Law number 110 of the year 2000, hereinafter referred to as the “Basic Act”) and has implemented related measures in a comprehensive and structured manner, in order to develop a “sound material-cycle society” where the consumption of natural resources is reduced and the environmental load is minimized to the extent possible.

Indicators designated by the Second Fundamental Plan for Establishing a Sound Material-Cycle Society are steadily progressing towards meeting their goals as seen in the drastic reduction of final disposal amount, which comes as a result of developments in 3R efforts, improvement of the legal base such as the individual Recycling Laws and efforts based on them, increased public awareness, and other efforts.

On the other hand, disposal of the vast amount of disaster waste from the Great East Japan Earthquake has become a serious social issue, and has shed light on the importance of creating a system that can smoothly handle the disposal of waste in response to large-scale disasters, even while we are under normal circumstances.

The accident at the Fukushima Daiichi Nuclear Power Station brought about unexpected situations, and the need to use circulative resources (reference 1) has been higher than ever, while making sure of environmental conservation and the safety and security of the public. At the same time, issues related to the treatment of waste drew keen attention, which led to a rise in awareness to take good care of things as long as possible and to cut down waste generation.

As mentioned above, the Great East Japan Earthquake and the ensuing accident at the Fukushima Daiichi Nuclear Power Station have posed important policy issues in our efforts toward establishing a sound material-cycle society based on the Second Fundamental Plan for Establishing a Sound Material-Cycle Society, though our efforts had been developing successfully until then. With this serious incident as an opportunity, we are now forced to re-examine what our policy should be like.

Also, further resource constraints are expected on a global scale, as seen in the rise in natural resources prices.

In consideration of all of the aforementioned, it can be said that policy issues to establish a sound material-cycle society are progressing from a stage where recycling, measured quantitatively, is carried out with an emphasis on reduction of waste generation, to a new stage where recycling is measured both quantitatively and qualitatively, waste is used more effectively as valuable resources and energy sources to raise

resource productivity and consumption of natural resource in danger of depletion is curbed, all based on the premise of environmental conservation, safety and security.

Developing nations, mainly in Asia, as seen in Japan during her high economic growth period, are facing serious problems related to the rapid increase in waste generation.

We need to share with these countries the wealth of experience and knowledge we possess on waste related issues and recycling, in order to take the lead in contributing to the establishment of a sound material-cycle society on a global scale.

The Third Fundamental Plan for Establishing a Sound Material-Cycle Society has been established to appropriately address such changes in different situations and, with the presupposition to conserve the environment in collaboration with each of the entities that comprise our society, to build a sound material-cycle society, both domestically and internationally, through the promotion of the 3Rs and other measures as a government-wide effort.

(Reference 1) Circulative resources

Waste, etc. that can be used. The Basic Act stipulates that circulative resources should be cyclically reused (reuse, recycle and heat recovery)

Chapter 1. Present Situation and Problems

Section 1. Present Situation

1. Domestic and international situations on the establishment of a sound material-cycle society.

Globally, economic growth and population expansion has led to the increase in waste generation. This is salient in the Asian region, and waste generation in the area accounts for approximately 40% of that of the world. Waste generation is expected to continuously increase in the future and global waste generation is forecasted to double by 2050 compared to 2010.

As seen in the rise of international resource prices, shortfall of supply to demand and lower grade of mineral resources (reference 2), and resource constraints are expected to strengthen around the world in the future. In view of the rapid increase in resource consumption on a global scale, the International Resource Panel (IRP) (reference 3), established by the United Nations Environment Programme (UNEP), points out that decoupling in terms of two aspects (reference 4), i.e., reducing resource usage per economic activity and reducing environmental load related to the use of resources, is needed.

With strong resource demand from developing nations including so-called emerging nations, Japan's export of circulative resources such as waste paper, iron and steel scrap, slag, and waste plastic has increased approximately 3.4 times during the period of 2000 to 2010. While waste treatment capacities of nations with relatively high GDP have improved to a certain level, there are still many nations that do not possess sufficient treatment capacities. Even in the nations that are equipped with treatment facilities, it is reported that treatment and recycling is something conducted at inappropriate locations other than the designated facilities and e-waste and plastic waste that contain toxic substances are treated inappropriately, which causes environmental pollution.

Regarding regulations on toxic substances, management of toxic substances in the lifecycle of electric and electronic products has been raised as a new issue at the Strategic Approach to International Chemical Management (SAICM) (reference 5).

Looking at the domestic social structure, Japan is facing population decline, low birthrate and aging of population, all of which will influence economic activities and waste generation. The overall material flow in Japan indicates that the amount of newly input natural resources is declining, the amount of materials in cyclical use is increasing, and therefore a shift to a resource-saving society is in progress.

The cyclical use rate, an indicator connecting "inlet" with "outlet", and the final disposal amount at the outlet have already reached the goals as stipulated in the Second Fundamental Plan for Establishing a Sound Material-Cycle Society, through efforts in the 3Rs and others by the public and by business operators.

On the other hand, efforts for 2Rs (Reduce, Reuse) (reference 6), which is prioritized over recycling in the Basic Act, are slow to progress, and efforts to recover useful materials from waste are not made at a sufficient level. Indicators to accurately measure such efforts have not been developed yet, either.

Taking into consideration the raised public awareness on safety and security after the Great East Japan Earthquake and the accident at TEPCO (Tokyo Electric Power Company) Fukushima Daiichi Nuclear Power Station, we need to work to achieve recycling with more emphasis on environmental conservation, safety and security than in the past.

With regard to the material flow indicators showing steady improvements, there is the possibility that the improvement may have been affected, if viewed in short terms, by the recent recession. We need to make continuous efforts to improve cyclical use rate and reduce final disposal amount, whatever be the economic conditions.

As seen above, Japan's efforts toward establishing a sound material-cycle society have come to a new stage, where we need to look at not only the reduction of landfill disposal through further curbing of waste generation and cyclical use but also the quality of recycling, such as further reductions of natural resources input and environmental loads, securing of resources through the recycling of useful metals, utilization of circulative resources and bio-mass resources as energy, and ensuring of safety and security.

(Reference 2) Grade of mineral resources

The grade of mineral resources represents the amount of metal content contained in mineral ores to be extracted and it is usually shown in terms of mass ratio. The degradation of mineral resources may lead to a rise in production cost. Also, there are concerns that environmental load may increase, caused by energy consumption in the process of refining as well as an increase in the emission of impure substances.

(Reference 3) International Resource Panel (IRP)

The IRP was set up by the UNEP in November 2007, gathering world-renowned scientists and specialists since sustainable use of natural resources had become a serious issue in the international society, caused by the expansion of economic activities on a global scale. The IRP aims to develop a coherent approach towards the management of worldwide resources and to become a driving force for decoupling.

(Reference 4) Decoupling

Decoupling is a term that means to "separate", which in the environmental field indicates a desirable situation where the environment load decreases while the economy grows (absolute decoupling) or the environment load increases but not as much as the economic growth (relative decoupling). Indicators of decoupling are those indicators which measure the level of separation between environment load and economical growth. Resource productivity (=GDP/Input of natural resources) is one such representative indicator.

(Reference 5) Strategic Approach to International Chemical Management (SAICM)

An international strategy and action plan adopted at the 1st International Conference on Chemicals Management (ICCM1) in February 2006 in order to meet the goal set forth (WSSD 2020 Goal) at the 2002 Johannesburg Summit (WSSD) to “use and produce chemicals in ways that minimize significant adverse effects on human health and the environment”. National governments, international organizations, the industrial arena, NPOs and other entities are working on a variety of efforts based on the SAICM.

(Reference 6) 2R (“Reduce”, “Reuse”)

The “2Rs” represents a general term for “Reduce” and “Reuse,” separated from among the 3Rs (“Reduce”, “Reuse”, “Recycle”). The 2Rs are prioritized over “Recycle,” yet is falling behind in terms of implementation.

“Reduce” is to reduce waste generation. Once waste has been generated, it will cause some environmental load anyhow, even if it could be used again as circulative resources. For this reason, it is most effective not to make waste generated in order to reduce environmental load from waste treatment.

“Reuse” is to use again used products, parts and containers, etc. As they are likely to maintain the same shape when used again, “Reuse” generally loses less resources and generates less waste than “Recycle”.

2. Progress in terms of indicators

(1) Material flow indicators

In the Second Fundamental Plan for Establishing a Sound Material-Cycle Society, the following targets pertaining to material flow indicators have been set to ensure appropriate recycling of materials.

(Table 1. Targets on material flow indicators)
Target Year: FY 2015

Indicator	Resource productivity (Reference 7)	Cyclical use rate (Reference 8)	Final disposal amount (Reference 9)	(Supplementary indicator) Resource productivity excluding earth & rocks
Target	Approx. 420,000 yen/ton (approx.403,000 yen/ton)	Approx. 14-15%	Approx. 23 million tons	Approx. 770,000 yen/ton (approx. 714,000 yen/ton)

*Figures in parentheses are figures updated using GDP figures for which the base year is changed to 2005.

(Reference 7) Resource productivity (= GDP/input of natural resources)

Input of natural resources is defined as the total amount of domestic and imported natural resources and imported products. Resource productivity represents a comprehensive indicator of how effectively industries and people utilize resources in their daily activities (how much they create affluence with fixed amount of resources) by calculating the real gross domestic product (real GDP) per certain amount of input of natural resources.

(Reference 8) Cyclical use rate (= amount of cyclical use / amount of cyclical use + natural resources input)

An indicator representing the share of cyclical use (reuse and recycled use) to total input in the economy and society.

(Reference 9) Final disposal amount

Amount of landfill disposal waste. The indicator is directly linked to the issue of securing final disposal (landfill) sites of waste.

Looking at the developments of these indicators in FY2010, resource productivity amounted to 374,000 yen/ton, cyclical use rate improved to 15.3%, and final disposal amount declined to 19 million tons. Cyclical use rate and final disposal amount have already reached their targets, and resource productivity has been rising steadily towards its target.

Resource productivity excluding input of earth and rocks amounted to 602,000 yen/ton in FY2010, up 10% over FY2000. However, it still has a long way to meet its target set for FY2015.

Greenhouse effect gas emission from the waste sector amounts to approximately 36.7 million t-CO₂ as of FY2009, a decrease of approximately 13% over FY2000.

(Table 2. Development of material flow indicators)

Fiscal year		2015 (Target year)	1990	2000	2005	2007	2008	2009	2010	vs. 2000
Resource productivity	10,000 yen/ton	42 (40.3)	-	24.8	30.8	33.7	33.9	37.9	37.4	+51%
Cyclical use rate	%	14-15	7.4	10.0	12.2	13.5	14.1	14.9	15.3	+5.3
Final disposal amount	Total (million tons)	23	109	56	31	27	22	19	19	-67%
	Municipal waste (million tons)	-	20	12	8	6	6	5	5	-58%
	Industrial waste (Million tons)	-	89	44	23	20	17	14	14	-69%
(Supplementary indicator) Resource productivity excluding earth & rocks	10,000 yen/ton	77 (71.4)	-	54.9	57.6	58.8	57.5	63.9	60.2	+10%

* Figures used for resource productivity and figures in parentheses in each fiscal year are revised figures, using revised GDP figures for which the base year is changed to 2005. Thus they do not necessarily conform to the past plans and inspected results.

(2) Monitoring indicators

Looking at the change in people's awareness and behavior toward establishing a sound material-cycle society, 98% reply that they recognize the importance of efforts to reduce waste generation and recycling, and 87% reply that they are actually taking such action. (Census on Environmental Issues (June 2012)).

Regarding municipal waste, per capita generation per day (municipal waste from designed collection and group collection as well as directly brought-in garbage, including business waste; it is converted to waste generation on a per capita and per day basis) amounts to 976g as of FY2010 (down 18% over 2000), and has reached the target of a 10% reduction over FY2000. Of this amount, business waste amounted to 12.97 million tons (down 28% over FY2000) in FY2010, meeting the target of a 20% reduction over FY2000. On the other hand, domestic waste generation (converted to per capita waste generation amount per day from households excluding group collection and recyclable waste, etc.) amounted to approximately 540g in FY2010 (down 18% over FY2000), not yet reaching the target set for FY2015 of a 20% reduction over FY2000.

The final disposal amount of industrial waste amounts to 14.26 million tons as of FY2010 (down 67% over FY2000). (Target for FY2015 is set at a 60% reduction over FY2000).

Business opportunities related to sound material-cycle society are also expanding. The market size is estimated at approximately 39 trillion yen with approximately 990,000 people employed.

Looking at current efforts for reducing containers and packages, their weight has been made lighter, refillable laundry detergent has increased enough to account for over 70% of total laundry detergent shipment and more people tend to refrain from using plastic shopping bags, whereas reusable returnable bottles are less often being used, with other more convenient containers replacing them.

Regarding current efforts on individual laws, the recycling rate for PCs as stipulated in the Law for the Promotion of Effective Utilities of Resources (Law number 48 for the year 1991), the recycling rate for 4 designated waste home appliances as stipulated in the Law for the Recycling of Specified Kinds of Home Appliances (law number 97 of the year 1998, hereinafter referred to as the “Home Appliance Recycling Act”), and the recycling rate for automobile shredder residue, etc. as stipulated in the Law for the Recycling of End-of-Life Vehicles (Law number 87 of the year 2002, hereinafter referred to as “End-of-Life Vehicle Recycling Law”), have already attained their legal targets, respectively.

Municipalities that implement sorted collection pursuant to the Law for the Promotion of Sorted Collection and Recycling of Containers and Packaging (Law number 112 of the year 1995, hereinafter referred to as the “Container and Packaging Recycling Law”) have been steadily increasing in number, with the result of the execution rate reaching 99% as of FY2011 (covering 99% of the population). By type of containers, however, there are some types of containers and packages of which sorted collection little takes place (35% for paper containers and packages and 74% for plastic containers and packages. It may be noted in this connection that, in the case of paper containers and packages, there are collection routes other than group collection, which is not covered by the Container and Packaging Recycling Law).

The execution rate for the recycled use of cyclical food resources as stipulated in the Law for Promotion of Recycling and Related Activities for the Treatment of Cyclical Food Resources (Law number 116 of the year 2000, hereinafter referred to as the “Food Waste Recycling Law”) has also been steadily increasing. As of FY2010, it was as high as 82% in the whole food industry. However, it is apt to get lower when it goes from “upstream” to “downstream”, i.e., from food manufacturing sector to food-service industry, due primarily to difficulties in sorting (94% for the food manufacturing industry (1.14 million tons of food waste not recycled), 37% for the food retail industry (810,000 tons of food waste not recycled), 17% for the food service industry (1.99 million tons of food waste not recycled). In addition, household food waste has been little recycled yet.

Section 2. Issues to be addressed

In light of the current situation regarding the establishment of a sound material-cycle society as described in Section 1, we need to address issues as shown below, in order to establish a sustainable sound material-cycle society where the environment and the economy go together in a virtuous cycle.

(1) Establishing a social and economic system where efforts for the 2Rs can be further promoted

In order to put restraints on the consumption of natural resources and reduce environmental load as much as possible, we must make it a basic principle to promote the 2Rs (Reduce and Reuse) before “Recycle” to the utmost extent.

To this end, we must work to incorporate the 2Rs into our social system, wherever possible, by re-examining if there is still any room to further promote 2R efforts in our social and economic scenes of life and business, including the manufacturing stage of products.

As part of such efforts, we need to promote “Reduce” and “Reuse” in our daily life on top of the reduction of containers and packaging and usage of returnable bottles, in order to decrease daily household waste generation per person.

Food loss poses an issue to us. It is estimated that a total of 5 to 8 million tons worth of food is being discarded every year, though it is edible. We need to take action for this issue, together with food related businesses and consumers. In this connection, now that the “target figures for the reduction of food waste, etc.” have been set according to the Food Waste Recycling Law, we should take advantage of this opportunity to promote the reduction of food waste through efforts in the entire food chain, including the households. Specifically we can open discussions amongst related businesses on the practices that lead to overproduction and returns, and reform consumer awareness on reducing food loss through dietary education and consumer education on topics such as correct understanding of freshness date.

Since there is a trend for the people to actively use “Reuse” products such as daily commodities in their lifestyle, it is an important task to take advantage of this trend to build and expand a sound “Reuse” market. On top of this, in order to promote 2R efforts as mentioned above, we need to push for a change in lifestyle by getting consumers to clearly understand the effects from 3R efforts including “Reduce” and “Reuse” and where the recycled resources are going in circulation.

The business sector is also asked to work on providing more 2R-oriented products and services, that is, long-lasting and resource-saving products and services.

Further, in accordance with the fact that, due to the 2011 law amendment, the “establishment of a sound material-cycle society” is now clearly manifested as the main purpose of environmental conservation activities by the Law for Enhancing Motivation on Environmental Conservation and Promoting Environmental Education (Law number 130 of the year 2003), we need to work on further promoting environmental conservation and other activities in schools and in the communities towards establishing a sound material-cycle society.

(2) Advanced use of recycled resources and securing of resources.

The usage of recycled resources is already in progress as evidenced by the cyclical use rate having reached the target in advance before the target year of FY2015.

On the other hand, recycling is in many cases implemented with the degradation of quality, not retaining the initial quality of products, and it is suspected that recycling costs have not been reduced so drastically, either.

Speaking of “inlet” for resource input, we have almost no mining of metal resources at home, and depend solely on imports from overseas.

While metal resource prices have been on the rise in recent years, it is estimated that if we compare the world’s total of resources already mined (terrestrial resource) with the amount of reserves currently confirmed as recoverable (underground resources), there are more terrestrial resources in existence than underground resources. Accordingly, the need to further tap into terrestrial resources has been even greater.

The demand for rare metals continues to increase, as it is an essential component for automobiles and precision instruments. Given its vulnerable supply structure, securing stable supply of these metals has also become a significant issue to be addressed.

Under such circumstances, it is important to facilitate the decoupling between environmental load and economic growth, by promoting green innovation (Reference 10) and developing a competitive recycling industry (Reference 11) that can hardly be influenced by the business cycles while improving the environment. Specifically, both arterial industry and waste management and recycling industry need to come together to work on the 3Rs while securing environmental conservation and improving the quality and reliability of recycled goods, etc.

It is also important for (1) manufacturers of products and waste-discharging enterprises, (2) waste treatment businesses and recycling operators and (3) enterprises that make use of recycled products to strengthen their cooperative efforts such as information sharing on the quality of recycled products, etc. By promoting such cooperation, they would also be required to make full use of waste treatment and recycling facilities developed through eco-town projects (Reference 12), etc.

Moreover, against the background of tight supply-demand situation of electricity after the Great East Japan Earthquake and revised energy and environment related policies, it is required to further promote the recycling of bio-mass recyclable energy based on the scheme for feed-in tariff for renewable energies as well as heat recovery from waste power generation, etc.

In order to promote such efforts, it is also important to create a social basis where recycle operators that engage in high quality recycling with high value added and less environmental load are socially recognized and supported.

(Reference 10) Green innovation

Innovation means to bring in completely new technologies and frameworks, as compared with the existing products and systems, and to create new values and bring about large social changes. Green innovation is innovation in the environmental and energy field.

(Reference 11) Recycling industry

Recycling industry means environmental industry that is engaged in waste management but also a building of a sound material-cycle society that is proactive in recycling waste, etc.

(Reference 12) Eco-town Project

A project launched in FY1997 to promote advanced urban development in harmony with the environment. Once a plan developed by prefectural governments and ordinance-designated cities according to their respective local features is approved by both Ministry of the Environment and Ministry of Economy, Trade and Industry, the relevant project can receive comprehensive and multilateral support.

(3) Ensuring security and safety

The Great East Japan Earthquake had a huge impact not only on the coastal regions on the Pacific side of Tohoku, but also on the economy of the entire nation and daily lives of the Japanese people. It reminded us that Mother Nature, which brings us an abundance of gifts, could at times also stand over us as a tremendous threat, by leaving us confronted with the issue of disposing a vast amount of disaster waste.

The accident at the TEPCO Fukushima Daiichi Power Station caused an unexpected situation of devastating environmental contamination due to radioactive substance contaminated waste from outside the premise of the nuclear power station, from which the people became much more aware of safety and security than before.

A large portion of PCB waste (Reference 13) is now under long-term storage, and we need to develop a better and stronger treatment structure towards completing the disposal as soon as possible. We also need to continue work to ensure appropriate management and disposal of asbestos waste, for which the standard has been stiffened for disposal.

In accordance with the above situation, efforts for environmental conservation, safety and security need to be strengthened through different measures, such as development of a system where waste disposal can be carried out smoothly in large scale disasters, appropriate processing of toxic substances to use as circulative materials, information sharing on toxic substances, and enhanced efforts to facilitate mutual communication and understanding among the concerned parties.

(Reference 13) PCB Waste

Since PCB was first manufactured as an industrialized product in 1929, it was long being used in electric insulating oils and carbonless duplicating papers and for various purposes, due to its stability, heat resistance, and insulation quality. However, PCB was later found bioaccumulative and chronically toxic, and therefore its production and import was prohibited as a rule in 1974. Internationally, in the Stockholm Convention on Persistent Organic Pollutants (mentioned in the below), signatory countries are obliged to ban production and usage, reduce emission of unintentionally created substances, appropriately manage and dispose of stock and waste of such substances including PCB, and draw up a domestic execution plan on these provisions.

(4) Integrated efforts to create a sound material-cycle and low-carbon society co-existing in harmony with the nature and advancement of local recycling zones.

Efforts to create a sound material-cycle and low-carbon society co-existing in harmony with the nature requires the readjustment of social and economic systems and lifestyles as referred to in the Fourth Fundamental Environment Plan (approved by the Cabinet on April 27th, 2012) and the National Strategy for the Conservation and Sustainable Use of Biological Diversity 2012-020 (approved by the Cabinet on September 28th, 2012). Thus we need to promote integrated efforts, at both local and national levels, towards creating a sound material-cycle and low-carbon society co-existing in harmony with the nature.

On creating local recycling zones (Reference 14), which can simultaneously lead to the revitalization of the local region, we need to consider the characteristics peculiar to each of the regions, including culture, and the connections among the local residents who live in that region, and to promote the creation of a system where recycling can take place on an appropriate scale, depending on the type of circulative resources such as resources to be used as a source of energy, thereby to continue creating model cases of development.

We should be able to create recycling systems that best fit each region while conserving the environment by, for example, (1) promoting a recycling of food waste into feed, fertilizers and biogas and effective utilization of timber in rural areas, (2) promoting, in urban and suburban areas, urban-rural cooperation where food waste generation in urban areas can be utilized as fertilizers in agricultural areas, as well as promoting cooperation with eco-towns and industrial areas, (3) utilizing, in arterial industrial areas, platforms and infrastructures of main arterial industries such as cement and steel and collaborating with large urban city areas for large amounts of circulative resources, and (4) further advancing, in sound material-cycle industrial areas, technologies owned by recycling operators and collaborating with arterial industrial areas, etc.

We also need to connect the “kizuna” (ties) in communities, which was re-recognized as important on the occasion of the East Japan Great Earthquake, with material recycling to build a new form of region.

Currently there are many ongoing programs aimed at revitalization in various parts of Japan. Since it is effective to promote local recycling zones, integrating with such programs, we need to look into the idea of providing appropriate assistance to the integrated efforts from such a viewpoint, thereby to advance the vision of local recycling zones.

Local recycling zones are also important as a place for hands on implementation of the integration of a sound material-cycle and low-carbon society co-existing in harmony with the nature, where people enjoy environmental conservation and feel safe and secured. For this reason we are required to bring in the concept of harmonious coexistence zones to our efforts.

(Reference 14) Local recycling zone

It is important to realize recycling on an optimal scale in accordance with local features and the quality of circulative resources, and therefore local recycling should be promoted wherever possible and, if not possible, it should be realized in a broader area. The concept of local recycling zones aims at building multi-layered recycling zones based on such an idea.

(5) Appropriate treatment of waste

In order to eradicate (any and all) illegal dumping and/or inappropriate treatment of waste, the government, businesses and people need to continue to make combined efforts with the concept of “responsibility of waste generator” as a basic principle. To address individual cases of illegal dumping and/or inappropriate treatment of waste, preventive measures such as enforcement of surveillance should be first to come, but in case illegal dumping and/or inappropriate treatment takes place, it is important to strictly pursue the discharger’s responsibility, while making efforts to restore to the original condition or redress.

Moreover, there are an increasing number of businesses that collect unneeded articles, which are usually classified as waste, from the households and a majority of the collectors do business with no certificate. Electronic home appliances collected by these collectors are either illegally dumped or inappropriately disposed of in Japan or are exported and then inappropriately disposed overseas. Since it is pointed out that they cause environmental pollution, it is necessary to enforce the aforementioned measures.

While the residual capacity at final disposal sites has continued to decrease, especially for municipal waste, the residual years is on the increase, due to the reduction of final disposal amount. The residual years for municipal waste are 19.3 years (as of FY2010) and 13.2 years for industrial waste (as of FY2009) on the national average.

Regarding municipal waste, many municipalities have not been able to secure enough final disposal sites. In addition, when they decide on the location, they are required to make a great deal of efforts to gain the understanding of the local residents, this making it difficult for individual municipalities to establish their own sites. Under such circumstances, we first need to make 3R efforts thoroughly, thereby reducing the number of facilities we manage, and then to develop final disposal sites covering a broader area as a last resort.

Final disposal sites for industrial waste are important as key facilities that become main waste pans for appropriate treatment, and they have been playing an important role in dealing with waste generated on the occasion of the Great East Japan Earthquake and in the following recovery phase. As such, it is critical to continue to develop such facilities appropriately so that our nation can maintain a long-term and stable treatment system.

(6) International efforts

On establishing a sound material-cycle society in respective Asian developing nations, consensus is being formed, such as a 10 year policy target for the promotion of the 3Rs in the Asia Pacific region being set at the Regional 3R Forum in Asia, which was initially launched based on the proposal of our nation, and the Ha Noi 3R Declaration (March 2013) which put together indicators to monitor achievements on each of the set targets adopted. It has become more important for our nation to take the initiative in promoting 3R efforts on sustainable production and consumption.

In order for each nation to address their waste issues appropriately, it is necessary to develop and appropriately operate waste management and recycling systems that match their needs. Thus we need to work on bilateral policy talks as well as provide specific assistance such as for development of national 3R strategies and legal framework.

We also need to work on bringing our venous and recycling industries overseas in order to leverage our 3R technologies to establish a sound material-cycle society on a global scale and, at the same time, to help revitalize our economy. However, although Japanese recycling industries have made certain achievements in the field of waste management equipment such as incineration in their overseas operation, their overall business from launch of waste management and recycling to operation is limited and falls behind US and European counterparts. Accordingly, we need to work to further promote international operations by the government and the private sector coming together to make collaborative efforts.

Regarding the management of toxic substances in the lifecycle of electric and electronic devices, which has been pointed out as a “new task” by the Strategic Approach to International Chemicals Management (SAICM), we need to continue to promote efforts by a variety of entities, and to consider further efforts as needed, while taking into consideration international dialogues, etc.

Amid international movements of circulative resources accelerating, we still find that illegal exports and imports are taking place across the borders, and therefore we need to work on further strengthening border control measures.

On the other hand, as international movements of circulative resources can, if properly performed, contribute to the reduction of environmental load and the effective use of resources, we must work on facilitating such movements of circulative resources where appropriate, taking into consideration current domestic use and assuring that there will occur no environmental pollution after the transaction.

Chapter 2. Medium to long term direction of efforts toward establishing a sound material-cycle society

To establish a sound material-cycle society, it is critical for each entity, while targeting the establishment of a sustainable society, to share understandings on a mid to long term direction towards establishing a sound material-cycle society and to fully perform their role through mutual cooperation and collaboration. We target to establish a sound material-cycle society as outlined below by 2030, assuming sufficient efforts by entities concerned.

Section 1. A society where circulation in the natural world harmonizes with that in the economic society

Our society stands on the cycle of taking large amounts of resources from the natural world, producing and consuming large amounts of a variety of products, and then disposing a large amount of things no longer needed into the natural world. However, we are wasting valuable resources on earth in this process, which sometimes inhibits healthy material cycles and puts a heavy load on the natural world.

The sound material-cycle society that our nation seeks will shift drastically from the mass-production and mass-consumption oriented economic society of the past to a society of sustainable activities, where the quality and amount of resource taken from the natural world and the waste generation into the natural world are within an acceptable range.

In this society, we should remain humble to the gifts and threats from nature and, in our economic activities, we should effectively utilize exhaustible resources that are once taken from the natural world as long as possible, as useful “social stock,” by endeavoring to make product life longer and implementing “Reuse” and “Recycle”. Further, we are asked to utilize biomass and other renewable resources within the limits of renewal speed. By doing so, the material cycle between air, water, soil, and organisms, etc. will be restored, making it possible to maintain a harmonious relationship between the circulation of the natural world and the circulation of the economic society.

Section 2. 3R-oriented lifestyle and the establishment of local recycling zones

We seek to establish a sustainable society where we switch from a mass-production and mass-consumption and one-way style lifestyle established in the second half of the 20th century to a lifestyle enabling affluent life to coexist with environmental conservation through recycling. In this way we can aim at building a sustainable society, which integrates with a low carbon society and a nature coexistence society.

In this society, people will “know they have enough”, “Reduce” will progress and “Reuse” will take root. For example, unneeded containers and packaging will be gone, refill products and recycled goods, adjustable menus to reduce food loss and food bank activities (Reference 15) will become widespread and, even in the households, efforts for reducing leftover food, eco-cooking (Reference 16) and other cooking gimmicks, conversion of food waste to fertilizers and waste sorting efforts will be generally in practice. All products such as daily commodities and clothing will be handed on to the next owner through a sound “Reuse” market. Reuse products will create new values by passing through different hands and time, and clothing unable to be reused will be made over and granted a new role.

High quality housing that can be used for a long term will be designed and be utilized generation after generation. Old homes and empty houses will be renovated or undergo makeover, to be used and cared for over a long time. The value of buying or owning products will fade and demand for lease and rental services will increase. Further, demand for repair and maintenance for longtime use is expected to increase. “Common ownership” takes root in our lifestyle, such as car sharing (Reference 17) and shared houses, and new values are placed on the ties between those who connect through common ownership. Moreover, 3R-oriented activities responding to the needs of the aging society and an increasing number of single-person households will take place, such as use of reusable shipping cartons for shopping and meal delivery services and strict reuse of tableware, containers and packaging.

Based on the concept of recycling circulative resources in its local regions as much as possible and to broaden the recycling circle in terms of area for those that have difficulty in recycling in the desired region, local recycling zones will be built in a multi-layered form.

In rural areas, biomass type circulative resources of the region, such as unused timber from forest thinning, livestock excreta and food waste after sorted collection, etc. will be used as feed, fertilizer and energy, etc. A local production for local consumption type of circulation where agricultural, animal, marine, and other products produced using such resources are consumed in the region will be established, and regional development utilizing both independent and distributed energy will advance. Manufacturing of products as well as services, both of which utilize the region’s circular resources, will gain force as community businesses.

Intensive resource recovery, as well as incineration and heat recovery of non-recyclables, will take place efficiently in large cities. Biomass type circulative resources such as sewerage sludge and food waste will be effectively utilized as energy sources.

Collection and material recycling of circulative resources from small sized electronic devices and others will be performed covering broader areas. Assuring the environment is conserved, efficient recycling of resources will progress, based on the advantage of the scale of economy as well as mutual cooperation in areas where the recycling industries cluster, such as eco-towns.

Through all of the above, natural resources consumption per capita will drastically decline compared to that at the beginning of the 21st century.

(Reference 15) Food bank activities

Activities where irregular products or loss merchandise in the distributing process are collected free of charge to be provided to welfare institutions, etc.

(Reference 16) Eco-cooking

To buy, cook, and clean in an environment friendly way. For example, environmental load can be reduced by not purchasing excessively, not discarding edible food, not cooking too much food, using vegetable skin without discarding as waste, making different dishes from leftovers, and others.

(Reference 17) Car sharing

A system in urban areas with well developed public transportation, where one does not own his own car, but readily shares the use of the most convenient car for his purpose, whenever necessary, as if it was his own car. This concept was invented in Switzerland in the late 1980s to resolve traffic problems and as part of environmental conversation activities. It had diffused into Europe in the 1990s and is now spreading into Japan in recent years.

Section 3. Developing a social and economic system with high resource efficiency

We will work towards a society where the use of fossil fuel and exhaustible resources is minimized and the recycling rate of circular resources is further improved, as well as efforts based on the idea of “responsibility of waste generator” (Reference 18) and “extended producer responsibility” (Reference 19) become common.

In this society, the concept of resource productivity will have prevailed in corporate management and manufacturing, and “Reduce” will be strictly enforced, such as further improvement of resource productivity in the manufacturing stage and reduction of unnecessary containers and packaging at the distribution and consumption levels. Further, based on the idea of design for the environment (DfE), (Reference 20) resource conservation models will increase in all products including home electric appliances, and they will be designed such that appropriate reuse, recycling, or disposal can be readily performed when they become waste. Also, long-life conscious products designed for long time use will increase with due consideration to energy conserving capabilities.

Enterprises that generate waste will work toward holding down waste generation as well as reducing generation amount by recycling. They will also select competent and quality waste treatment businesses when commissioning the treatment of their waste.

The waste management and recycling industry will increase its international competitiveness and highly develop as a recycling industry that effectively utilizes circulative resources as raw material and energy to produce high added value. As part of such development, they will further tap into using urban mines where huge accumulation of resources is continuing.

Efficient venous logistics systems will develop and, with the development and enhanced convenience of recycle ports (comprehensive venous logistics hub ports), environment friendly marine transport designed for the needs of long distance mass transportation will be actively utilized.

Further, on financing that supports business activities, investment and loans for environment friendly corporations and projects and loans for environment-oriented capital spending will advance, thereby making it possible to supply appropriate funds to corporate efforts for the 3Rs.

(Reference 18) Responsibility of waste generator

A concept where the one who generates waste should be responsible for its appropriate recycling and treatment.

(Reference 19) Extended producer responsibility.

A concept where, regarding manufactured products, the producer is held partially responsible not only for material input, manufacturing and use of the product, but also after the product becomes waste.

(Reference 20) Design for environment (DfE)

A method used to make arrangements for environmental conservation in the designing process of products, such as using a single material to make it easier to decompose or recycle. It is also called environmentally adapted design or eco-design.

Section 4. Assuring safety and security

We will work towards establishing a society where a system that can appropriately dispose of waste, including toxic substances, is readily in place.

In such society, standards of recycled products for safety and security will be set and observed, and appropriate recycling will be performed. (Recycling of food related containers and packaging will premise the safety of food being secured). Also, management of chemical substances will be enforced in the entire lifecycle of products,

Illegal dumping, inappropriate treatment and illegal exports will no longer exist, and competent waste treatment businesses with high morals will efficiently perform disposal treatment based on the conservation of the environment. Along with the development of 3R efforts, final disposal amount will be further reduced and sufficiently sized final disposal sites will be secured. Waste incineration facilities will be performing roles as supply centers of energies such as heat and electricity.

On the occasion of large-scale disasters, quick disposal of waste will be performed, people will have an enhanced understanding of security and safety, and appropriate mutual understanding and information sharing among the government, businesses and citizens will be seen.

Section 5. International efforts

We will work towards a society where our nation contributes to the reduction of global environmental load through promotion of multilateral cooperation via the Regional 3R Forum in Asia, etc. and collaboration with international organizations, bilateral cooperation and overseas operation by Japanese recycling industry such as venous industry, and the management of appropriate export and import of circulative resources.

In such society, multi-layered efforts on international dialogues and collaborative relationships amongst governments, local public authorities, private sector, etc. are promoted and, therefore, the recycling of resources in Asia will be facilitated. Moreover, organic cooperation of recycling zones will be pursued among different countries as well as among local areas in each nation.

For example, Japanese recycling industry, which will have increased in scale to possess both capital strength and technology, will play an important role in developing a worldwide sound material-cycle society from a business perspective, where they actively take in and process overseas waste that have value as resources but cannot be appropriately processed in developing nations, making it possible to reduce negative impacts on the environment and health, while seeking effective use as resource

While securing intellectual property rights properly, experiences, technologies and systems owned by Japanese governments, both national and local, business entities, as well as academic and research institutions, will be transferred to other countries, where appropriate, judging from their social situations. Moreover, taking into consideration the international demand and supply of resources, the resources that cannot be effectively used in Japan will be exported overseas in an appropriate form to be effectively utilized.

Illegal exports and imports of waste will have disappeared. Speaking of international efforts being made to take countermeasures against illegal exports and imports pursuant to the Basel Convention (Reference 21), our nation will pursue a further active role through assistance of its enforcement in developing nations. Progress is also expected for development of a framework for environmentally sound management (ESM) that contributes to the international recycling of resources. The mutual recognition of facilities is also expected to develop that meet ESM standards.

Many trainees will be seen to come to Japan from a variety of countries to receive intensive training on knowledge and experience, and to return to their home country to lead the establishment of a sound material-cycle society of their own.

Through such activities, while the reduction of environmental load on a global scale, as well as the establishment of a global sound material-cycle society, will be promoted, the revitalization of our economy and securing of resources will also be integrally accomplished.

(Reference 21) Basel Convention

Its official appellation is the “Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and Their Disposal”. The convention was adopted in 1989 and came into effect in 1992, and Japan acceded in 1993. It stipulates the application of the permission system and advance notice system for the export of toxic waste and the obligation to re-import wastes if inappropriately exported or disposed.

Chapter 3. Indicators and numerical targets for establishment of a sound material-cycle society

In order to establish a sound material-cycle society, it is necessary to accurately understand the current status on the amounts of resources extracted, consumed and disposed, and make improvements on them.

In this Plan, as in the Second Fundamental Plan for Establishing a Sound Material-Cycle Society, we continue to use “resource productivity”, “cyclic use rate” and “final disposal amount” as indicators for which targets are set. These indicators represent the three dimensions of material flow, which are “inlet”, “circulation” and “outlet”, in order to establish a sound material-cycle society by further developing individual measures such as reduction of waste generation, reuse, recycled use, heat recovery and appropriate disposal, etc.

Supplementary indicators will also be used to supplement the above indicators intended to set targets.

On top of this, as in the Second Fundamental Plan for Establishing a Sound Material-Cycle Society, effort indicators will be set to measure and evaluate how much efforts have been made by each entity towards the establishment of a sound material-cycle society, which cannot be understood from material flow indicators alone, as well as to further promote their efforts. Accordingly, with regard to effort indicators, we will also set indicators to monitor current developments in addition to indicators intended to set targets.

In this third Plan, we will also focus on the “stock” of materials, which, along with material flow, is important for the establishment of a sound material-cycle society.

The Great East Japan earthquake and the accident at TEPCO Fukushima Daiichi Nuclear Power Plant, while generating vast amounts of disaster waste, will pose various influences on the above mentioned indicators, such as the use of circulative resources.

For these reasons, in evaluating progress in each of these indicators, we need to perform the utmost detailed analysis of how they may be influenced by different factors, while taking into consideration domestic and international economic situations and developments of recycling technologies as well as waste disposal caused by the Great East Japan Earthquake. And then, based on the results, we should make a precise evaluation of the progress of each indicator and corresponding efforts towards meeting their targets.

Table 3. Material Flow Indicators

Type of Indicator	Indicator	Target for FY2020
Indicators intended to set targets		
Inlet	Resource productivity	460,000 yen/tons
Circulation	Cyclical use rate	17%
Outlet	Final disposal amount	17 million tons
Supplementary indicators to set targets / Indicators to monitor development		
Inlet	Resource productivity in terms of primary resources converted	-
	Resource productivity excluding earth and rocks	680,000 yen/tons
	Resource productivity of fossil resources	-
	Input of biomass resources	-
	Resource productivity of manufacturing/Resource productivity by industry	-
Circulation	Cyclical use rate measured at outlet (emission)	45%
	Exports and imports of circulative resource	-
	Cyclical use rate of metal resources on a TMR basis, taking consideration into hidden flows	-
Others	Emission of greenhouse gas from the waste sector	-

Table 4. Effort Indicators.

Indicator		Target for FY2020
Inlet	Resource consumption per capita	-
	Reduction of municipal waste.	-25% from FY2000
	Per capita household waste generation per day.	-25% from FY2000
	Business waste generation	-35% from FY2000
	Local public entities that perform paid collection service for life-related waste in percentage	-
	Average use years of durable consumer goods.	-
	2R efforts	-
	People that refrain from using plastic shopping bags (rate of "my bag" users) in percentage	-
	Shipments of refills/replacements in percentage	-
	Development in reuse rate of bottles	-
Market size of reuse and sharing	-	
Circulation	Recycle rate of municipal waste	-
	Number of local public entities that collect used small sized electronic devices, etc. / Percentage of implementation in terms of the number of population	-
	Power generation and heat utilization at waste incineration facilities	-
	Number of power generation facilities	-
	Capacity of power generation facilities	-
	Total power generation	-
	Number of heat utilization facilities	-
Total heat utilization	-	
Outlet	Number of certified supreme disposal businesses for industrial waste	-
	Diffusion rate of electronic manifests	50% (target for FY2016)
	Number / amount of illegal dumping	-
Others	Indicators focusing on policy areas	-
	Efforts toward establishment of a sound material-cycle society in local areas	-
	Number of fundamental recycling plans drawn up by local governments	-
	Number of efforts made toward the establishment of local recycling zones	-
	Number of local public entities cooperating with overseas cities for establishment of a sound material-cycle society.	-
	Indicators focusing on efforts by related entities	-
	Citizens	-
	Awareness and action related to sound material-cycle society	-
	Reduction of waste generation and awareness for cyclical use and green purchase	Approximately 90%
	Implementation rate of specific 3R actions	Approx. 20% increase over FY2012 Census results.
	Businesses, etc.	-
	Implementation of environmental management, etc.	-
	Market size of recycling-oriented society business	66 trillion yen (Approximately double from FY 2000)
	Government	-
Achievement of targets in individual recycling laws.	-	

Section 1. Material flow indicators
1. Indicators intended to set targets

With establishment of individual recycling laws and progress in 3R efforts, our nation’s material flow indices are greatly improving. In particular, targets for cyclical use rate and final disposal amount set in the Second Fundamental Plan for Establishing a Sound Material-Cycle Society have been accomplished in advance before the target year of FY2015.

On the other hand, we still need to work on further improvement of material flow indicators as we are more asked to reduce natural resource consumption in accordance with increasing global constraints on resources and taking into account insufficient progress in the recycling of metal related waste and food waste from the households.

In order to do so, targets will be set, with FY2020 as a target year, for “resource productivity”, “cyclical use rate” and “final disposal amount”, which represent three dimensions of material flow .

(Table 3. Targets on material flow indicators)

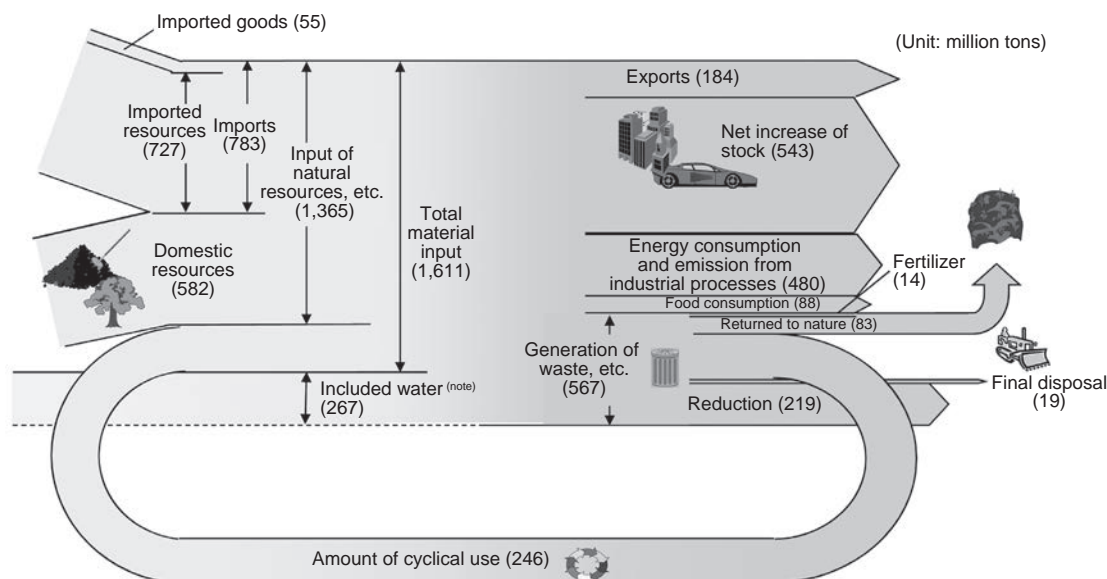
Target year: FY2020

Indicator	Resource productivity	Cyclical use rate	Final disposal amount
Target	460,000 yen/tons	17%	17 million tons

*Industrial waste accounts for 12.75 million tons of the final disposal amount.

(Reference)

Figure 1 Illustration of material flow in Japan in FY 2010 (prepared by the Ministry of the Environment)



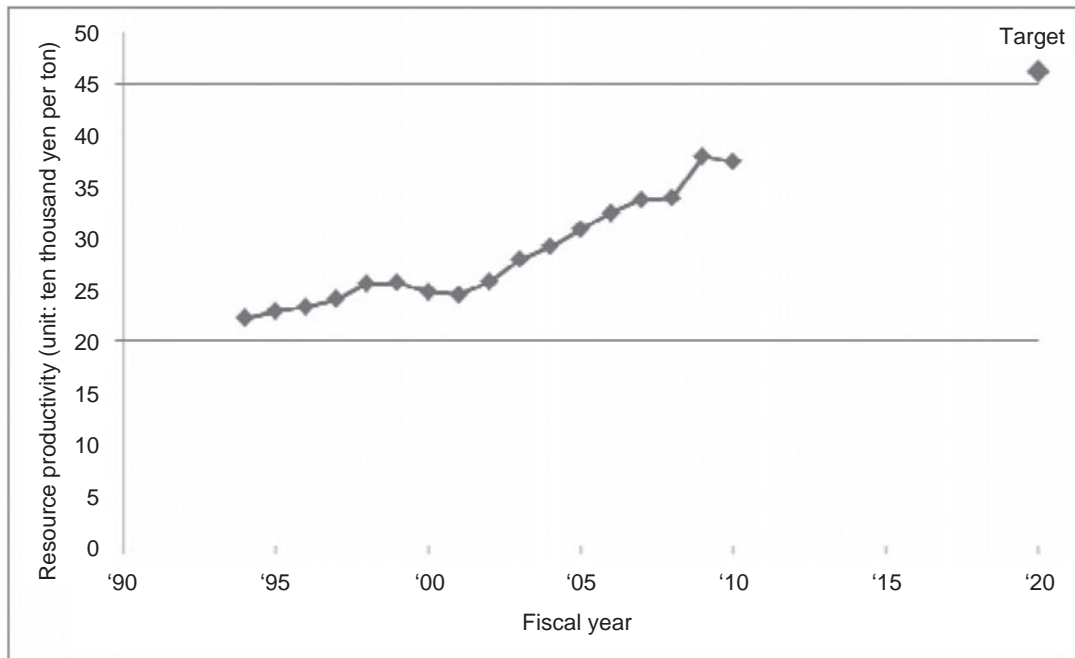
Note: Included water: Water included in waste, etc. (sludge, animal manure, human waste, waste acid, waste alkali) and sediment, etc. associated to economic activities (sludge from mining, building and water works and tailing from mining)

(1) “Inlet” : Resource productivity (= GDP /Input of natural resources, etc.)

The target for resource productivity in FY2020 will be set at 460,000 yen/tons (approximately an 80% increase over 250,000 yen/tons in FY2000).

(Reference)

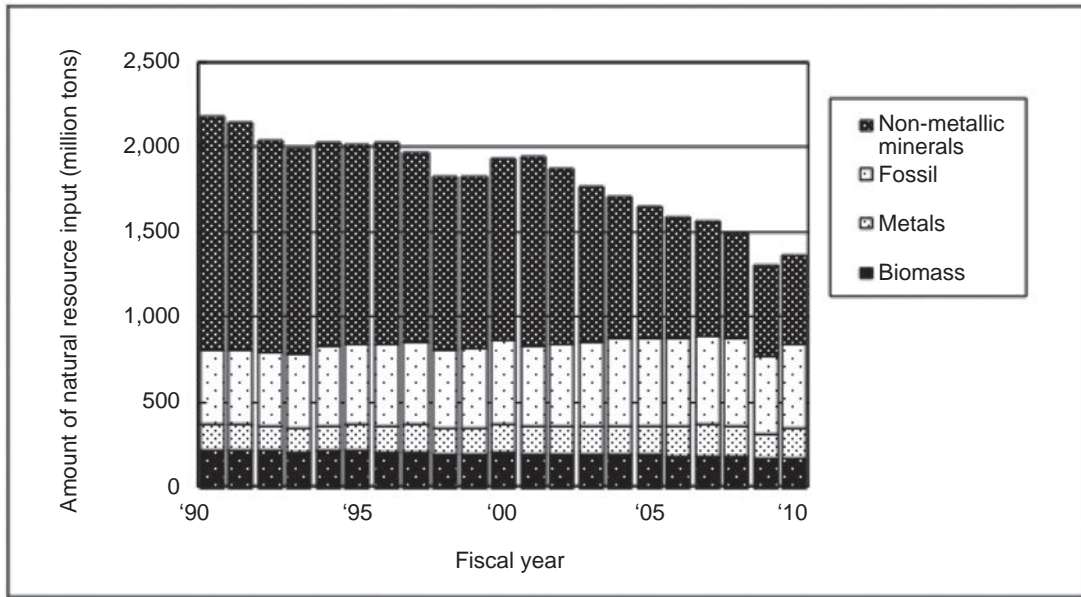
Figure 2. Development of resource productivity (estimated by the Ministry of the Environment)



* “Resource productivity” is an index that comprehensively represents how effectively materials are used in industrial activities and in people’s daily lives. Natural resources are limited in quantity, cause environmental loads when extracted, and finally become waste. Therefore, it is desirable that resource productivity improves, where a fixed amount of GDP is effectively created with less input of natural resources. In this connection, it should be noted that “natural resources input” indicates the amount of domestic and imported natural resources and imported products, which is referred to as Direct Material Input (DMI) as well.

(Reference)

Figure 3. Breakdown of natural resources by type of resources (estimated by the Ministry of the Environment)

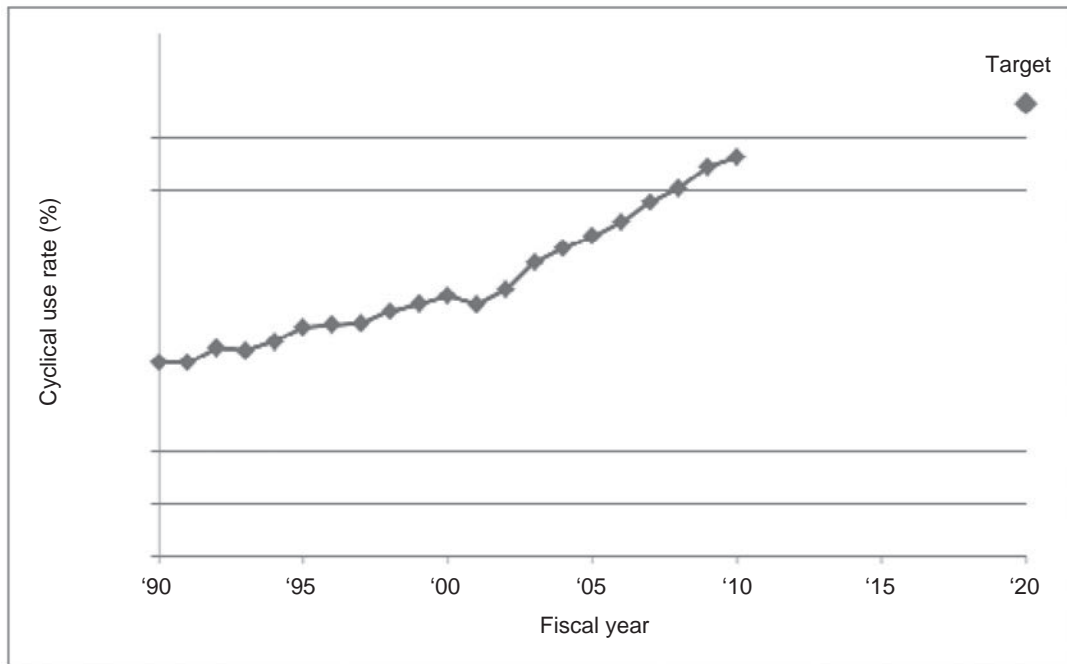


(2) “Circulation” : Cyclical use rate (= Amount of cyclical use / (Amount of cyclical use + Input of natural resources, etc.))

The target for cyclical use rate in FY2020 is set at 17%. (approximately a 70% improvement over about 10% in FY2000).

(Reference)

Figure 4. Development of cyclical use rate (estimated by the Ministry of the Environment)



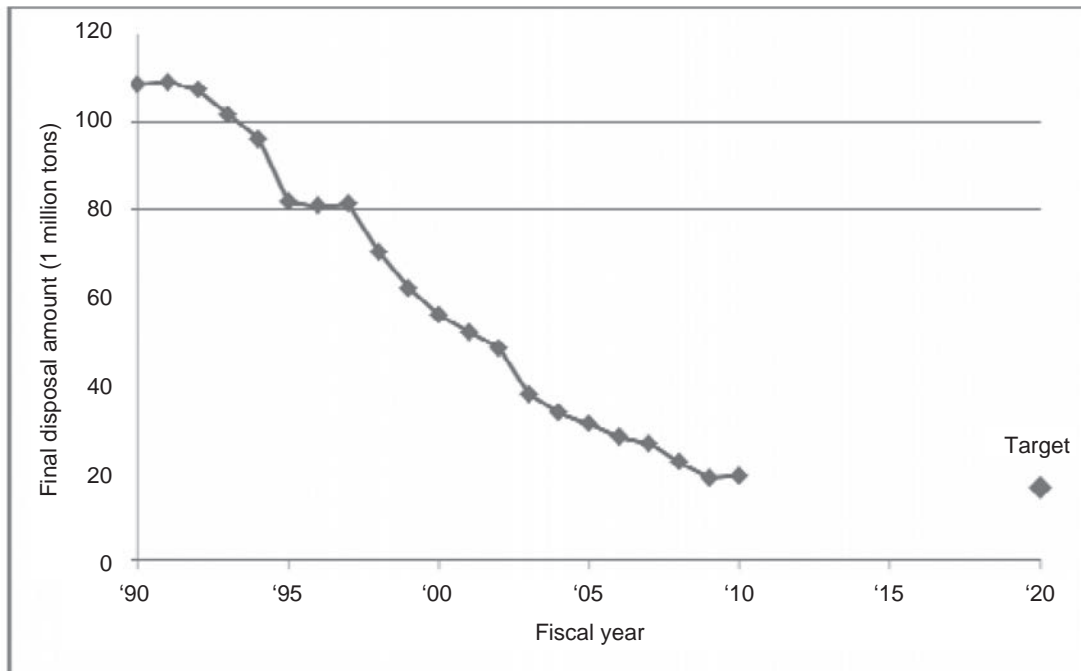
* The “cyclical use rate” is an index that represents the ratio of cyclical use (reuse + recycled use) to total input into an economic society.

(3) “Outlet”: Final disposal amount

The target for final disposal amount is set at 17 million tons (including 12.75 million tons of industrial waste) in FY2020 (approximately 70% less than about 56 million tons in FY2000)

(Reference)

Figure 5. Development of final disposal amount (based on Ministry of the Environment’s research)



2. Supplementary indicators intended to set targets / indicators to monitor developments

(1) Inlet

① Resource productivity in terms of primary resources converted

Regarding imported products which constitute the input of natural resources or the denominator of resource productivity, their estimated weight is taken into account, but the input of natural resources that was used in their production process overseas is not included in this calculation.

Accordingly, to appropriately grasp total amount of resources consumed in our nation’s economic activities, we will monitor the development of resource productivity in terms of an indicator called “raw material input” (RMI), on which the estimated weight is added of all raw materials (primary resources) required for the production of imported products.

② Resource productivity excluding input of earth and rocks as resources (supplementary indicator intended to set a target)

Since earth and rocks heavily influence the input of natural resources or the denominator of resource productivity, it is important to measure and evaluate our efforts in terms of resource productivity of natural resources excluding earth and rocks.

For this reason, we will use resource productivity per unit of natural resources input excluding earth and rocks as a supplementary indicator to set a target. The target will be set at 680,000 yen/tons for FY 2020 (approximately a 20% improvement from 550,000 yen/tons in FY2000).

(Reference) 602,000 yen/tons as of FY2010.

③ Resource productivity of fossil resources

In addition to the fact that fossil resources are exhaustible and therefore require efficient use, it is necessary to see such resources from the viewpoint of preventive measures for global warming. For this reason, we will monitor the development of resource productivity per unit of fossil resources input.

④ Input amount of biomass resources

Since the use of biomass resources is desirable assuming they are collected with due consideration to the environment, we will monitor the development of the ratio of biomass resources to total natural resources input in order to grasp the current situation.

⑤ Resource productivity limited to manufacturing/resource productivity by industry

As resource productivity is apt to improve when the industrial structure shifts from heavy resource-consuming industries to those that do not consume as much resources, it is important to figure out resource productivity focusing exclusively on secondary industries such as manufacturing, since our nation places importance on manufacturing. Thus we will monitor the development of resource productivity limited to manufacturing (note) in the secondary industry.

With regards to the development of resource productivity, a look at resource productivity by industry, in addition to that of Japan's entire industry, will provide a more accurate picture of where we stand. For this reason, we will monitor the development of resource productivity by industry as well.

In this connection, it should be noted, however, that resource productivity is an effective indicator in monitoring the development by industry or making comparisons within a group of businesses that manufacture the same type of products, but that it is not suited to compare between industries operating in different fundamental conditions.

(note) Resource productivity limited to manufacturing = Amount of final demand in secondary industry / total materials input in secondary industry, converted to its equivalent in primary resources (excluding earth and rocks)

(2) Circulation

① Cyclical use rate at outlet (emission)

Cyclical use rate is created as an indicator at inlet (input), with Japan's total materials input as the denominator. This is because a sound material-cycle society we endeavor to form is a society where the input of natural resources is appropriately reduced at the inlet, not a society aimed at mass-production, mass-consumption, mass-disposal and mass-recycling.

On the other hand, it is appropriate to use waste generation as the denominator from the viewpoint of accurately measuring the efforts of waste-discharging and recycling businesses, and actually there are many nations that use such an indicator based on this idea.

To this end, on top of the cyclical use rate at inlet (input), used as an indicator to set a target, we will introduce a cyclical use rate at outlet (emission) as a supplementary indicator to set a target, which is set at 45% in FY2020 (approximately a 25% improvement from about 36% in FY2000).

With regard to the cyclical use rate at outlet (emission), we will assess and inspect the scope of calculation in due course, paying attention to the viewpoint of comparing with similar indicators of other nations.

(Reference) 43% in FY2010

② Exports and imports of circulative resources.

Regarding the international movement of circulative resources, we will monitor the development of export and import amounts of circulative resources in order to gain an overview of domestic and international circulation of resources.

③ Cyclical use rate of metal resources on a TMR basis including hidden flows

Mining development to extract metal resources may pose a variety of influences on our living environment, biodiversity and natural environment, such as destruction of ecosystem by deforestation and water contamination by inappropriate treatment of soil, stones and heavy metals generated by the extraction, unless appropriate environmental measures are taken.

While the convenient and affluent lifestyle of our nation stands on the consumption of large amounts of metal resources, we need to be well aware that there is the possibility we are causing heavy environmental loads in other nations where resources are extracted.

Total material requirement (TMR) represents total amount of materials accompanied by the extraction and mining of certain resources including "hidden flows" of such materials as mineral ores, earth and sand, which are generated in association to the extraction and mining of the resources.

By examining the input of metal resources on a TMR basis, which includes hidden flows, it would be possible to evaluate full impacts on the environment of the use of resources.

As such, while making a more-focussed evaluation of environmental effects at inlet from the extraction of resources, we will monitor the development of the cyclical use rate of TMR-based metal resources to grasp how metals are being recycled. By monitoring such cyclical use rate of metal resources, it eventually becomes easier to gain an understanding of environmental effects of various metals other than steel, which accounts for an overwhelmingly large part of metals in terms of weight.

When utilizing TMR indicators for metal resources, we need to note that, a) although it is necessary to gain accurate information on the grade and type of mineral ores at mines where metal resources are extracted, it is difficult to obtain such information from overseas mines and therefore we must rely on estimates to some extent, b) such information does not necessarily indicate the magnitude of the impact on the environment directly and c) it is currently difficult to accurately figure out the recycling rate for each type of metals and therefore we have to rely on estimates.

(3) Others

Emission of greenhouse effect gas from the waste sector

From the viewpoint of measuring progress of the integrated efforts towards establishing a low-carbon society and a sound material-cycle society, it is important to work on the reduction of greenhouse effect gas emission from the waste sector, and from other sectors as well by making use of waste as raw materials and fuel as well as sources for power generation.

Thus we will follow the development as a monitoring indicator, and we will examine supplementary targets to set, considering how discussions on countermeasures for global warming and their implementation will make progress after FY2013.

Section 2. Effort indicators

1. Inlet

(1) Resource consumption per capita

It is important to measure and evaluate how each citizen consumes resources in their daily lives directly and indirectly in addition to production-based indicators such as resource productivity, toward establishing a sound material-cycle society where the input of natural resources is constrained. Thus we will monitor the development of per-capita resource consumption, which is obtained by dividing total amount of materials consumed in domestic economic activities (natural resources input less the portion of exports, both converted to an equivalent in terms of primary resources; Raw Material Consumption (RMC)) by the population.

(2) Reduction of municipal waste (indicator to set a target)

We will set a target of reducing the per-capita waste generation per day (municipal waste from designed collection, direct collection and group collection, including business waste) by approximately 25% (about 890 grams) compared to FY2000. It can be used as an overall indicator to measure the progress in the reduction of municipal waste, part of which is recycled.

(Reference) 1,185 grams in FY 2000 and 976 grams in FY 2010

① Per-capita household waste generation per day.

We will set a target of reducing per-capita household waste generation per day, excluding waste through group collection and recyclable waste, by approximately 25% (about 500 grams) in FY2020 compared to FY 2000, which is a main indicator to represent efforts by the public for waste reduction and sorted collection.

(Reference) Approximately 660 grams and 540 grams in FY2000 in FY2010, respectively.

② Business waste generation.

We will set a target of reducing “total amount” of business waste generation by approximately 35% (about 11.7 million tons) in FY2020 compared to FY 2000, which is a main indicator to represent corporate efforts for municipal waste reduction and sorted collection.

(Reference) 17.99 million tons in FY2000 and 12.97 million tons in FY2010

* Since there is a large fluctuation in the number of business establishments and a significant variance is also seen in the amount of waste generation by size of business establishment, we will set “total amount” of waste generation as an indicator, not waste generation per business establishment.

(3) Ratio of municipalities implementing paid waste collection services for household waste

Paid waste disposal services is an effective measure in promoting the reduction of waste generation from the households in local areas and, therefore, we will monitor the development of the ratio of municipalities that implement such paid waste collection to a total of municipalities.

(4) Average number of years of use for consumer durable goods

Using cars and electric appliances for a long duration of time leads to the reduction of waste generation and consumption of natural resources to be used in the production of such products. Accordingly, we will monitor the development of the average number of years for consumer durable goods, while taking into consideration the effects on global warming.

It may be noted in this connection that, from a viewpoint of grasping a more comprehensive number of years of duration covering a wider range of consumer durable goods, we need to measure the average number of years that buildings such as houses are used.

(5) Efforts for 2Rs

To measure people's efforts for "Reduce" and "Reuse", we will monitor the development of: ratio of people refraining from the use of plastic shopping bags (rate of "my bag" users), ratio of refill and replacement products in total shipments, "Reuse" rate for bottles and "Reuse" and "sharing" market size, in addition to the indicators mentioned above.

2. Circulation

(1) Recycle rate of municipal waste

We will monitor the recycle rate of municipal waste as an effort indicator for local public bodies to promote recycling.

In order to gain an overall recycle rate in the entire local area, however, we need to address a challenge of obtaining the recycle rate in the private sector.

(2) The number of local governments collecting used small sized electronic devices, etc. and the percentage of recycling in terms of the population covered.

As it is important to make the Law for Promoting the Recycling of Small-size Electronic Appliances (Law number 57 of the year 2012, hereinafter referred to as the "Small-sized Electronic Appliances Recycling Law") established in 2013 as the main recycling framework, we will monitor the number of local public bodies collecting used small sized electronic devices and the percentage of recycling in terms of the population covered.

(3) The current status of power generation and heat utilization at waste incineration sites

To measure the contribution of efforts for establishing a low-carbon society, we will monitor the development of ① number of power generation plants ② capacity of power generation plants, ③ total amount of power generated, ④ number of heat utilization facilities and ⑤ total amount of heat utilized, each in waste incineration sites.

3. Outlet

(1) Number of certified presume industrial-waste disposal business operators

As an effort indicator for qualified waste disposal business operators to which waste-discharging enterprises can have complete confidence in consigning their waste, we will monitor the number of certified presume disposal business operators according to the Law Concerning Waste Disposal and Scavenging (Law number 137 of the year 1970, hereinafter referred to as the Waste Disposal Law).

(2) Diffusion of electronic manifests (indicator to set a target)

In order to work on securing appropriate disposal of waste, we will set a target of increasing the diffusion rate of electronic manifests (Reference 22) to 50% by FY2016.

(Reference) Approximately 25% in FY2011

(Reference 22) Electronic manifest

Manifest is a system where waste-discharging enterprises manage the flow of waste and ensure its appropriate treatment by delivering a document (manifest) when consigning its waste treatment to a disposer and by receiving a copy of the document signed by the disposer when the treatment is complete.

Electronic manifest is the replacement of paper manifest, enabling data transactions electronically through a network. Not only does it streamline information management for both waste-discharging enterprises and disposers, but it also has other benefits such as a streamlining of supervisory activities over waste treatment by prefectural governments and prompt investigation on those who engage in inappropriate disposals.

(3) Current state of illegal dumping.

We will monitor the number and amount of illegal dumping as an indicator for inappropriate waste treatment.

4. Others

(1) Indicators focusing on the area

① Efforts in local regions towards establishing a sound material-cycle society

As an effort indicator widely covering the 3Rs by local public bodies, we will monitor the number of fundamental recycling plans (including fundamental environment plans even partially referring to the establishment of a sound material-cycle society) drawn up by local public bodies as well as the number of cases of action for establishing local recycling zones.

② Indicator on progress in the promotion of international efforts

In order to measure our contribution to the establishment of a sound material-cycle society overseas, especially in Asia, we will monitor the number of local public bodies collaborating with overseas cities in establishing a sound material-cycle society.

(2) Indicators focusing on efforts by entity group.

① Citizens

a. Awareness on and actions related to a sound material-cycle society (indicator to set a target)

Referring to results of surveys and polls on citizens' awareness and efforts toward establishing a sound material-cycle society, we will set such targets that ① approximately 90% of the people should have awareness on waste reduction, cyclical use and green purchase (Reference 23) and ② the number of the people who actually engage in each of specific 3R activities should increase 20% compared to the results of the poll conducted in FY2012.

(Reference) Poll on environmental issues (June 2012)

Percentage of citizens engaging in actual efforts (main topics only)

*Use refill products 59%

*Refrain from using plastic shopping bags or ask for less packaging 59%

*Do not leave food uneaten or try not to throw away foodstuff 56%

*Do not purchase disposable products 28%

*Cooperate in collection at shops of small-sized electronic devices such as mobile phones 26%

*Buy products that use reusable containers such as beer and milk bottles 23%

*Buy recycled products made of recycled materials 21%

*Use rental/lease services in order not to buy unnecessary products 20%

② Business operators, etc.

a. Implementation of environmental management, etc.

In order to promote efforts toward establishing a sound material-cycle society in business activities, we will monitor: number of environmental management system certifications acquired (The international standard ISO 14001 (Reference 24), Eco-action 21 (Reference 25) which is an environmental management system for small to mid-sized companies); diffusion of environmental reports (Reference 26) and environmental accounting (Reference 27); implementation status of organized green purchasing and development of guidelines for product assessment (design for the environment) by industries.

We will also monitor the number of business operators that have set goals towards improving resource productivity in respond to a macro indicator “resource productivity limited to manufacturing”.

b. Market size of business related to sound material-cycle society (indicator to set a target)

As an indicator to measure the growth of environmental industries in the area of recycling, we will target to double the market size (approximately 66 trillion yen) of business related to sound material-cycle society in FY2020 compared to FY 2000.

We will also monitor the number of employment in the business related to sound material-cycle society.

(Reference) Approximately 33 trillion yen and 39 trillion yen in FY2000 and in FY 2009, respectively

③ **State**

Achievements of targets stipulated in individual recycling laws

We will evaluate the state of achievements of targets and plans pursuant to individual recycling laws. In so doing, we will contrive ways to display in such a way that each of the achievements can be understood at a glance.

(Reference 23) Green purchase

To consider whether or not a certain product or service is really needed before actually purchasing it, in consideration of the environment, and give priority to a selection of products and services with less environmental loads.

(Reference 24) ISO14001

A key standard in the ISO14000 series, which is a group of international standards on environmental management, established by the ISO (International Organization for Standardization). ISO 14001 defines requirements for establishing a system that will continuously enhance the structure that will improve environmental performance such as reduction of environmental loads from corporate activities, products and services (EMS: Environmental Management System).

(Reference 25) Eco-action 21

A pro-environment tool that integrates an environmental management system with evaluation of environmental performance and environmental reports so that environment friendly initiatives can be readily addressed at small/mid-sized companies, educational institutions, local public bodies, etc.

(Reference 26) Environmental report

A report put together by each of companies and other business operators to make public messages from chief executive officers, policies, targets and action plans concerning environmental conservation, status of environmental management (environmental management system, environmental accounting, legal compliance and design for environment, etc.) and efforts for reduction of environmental loads, etc.

(Reference 27) Environmental accounting

A system in which companies recognize and measure the cost for environmental conservation and fruits of such activities in their operations quantitatively (in monetary units or physical units) to efficiently and effectively promote efforts for environmental conservation as well as to maintain a good relationship with society.

Section 3. Agendas for the future**1. Material flow indicators for international comparison**

In order to enable international comparisons with other developed nations and Asian nations, we will actively contribute to discussions at the Organization for Economic Co-operation and Development (OECD) and UNEP regarding statistical inadequacies and the coefficients for conversion for which the consensus has not been reached yet internationally. We will especially provide assistance toward the organization of statistics etc. for the enhancement of material flow figures such as resource productivity, cyclical use rate, and final disposal volume etc. in Asian nations.

2 Indicator on environmental efficiency

With regard to an indicator named “environmental efficiency” measuring the efficiency between environmental loads and value-added of products and services, whether it is useful or not is being debated internationally, aside from resource productivity.

With this in mind, we will examine: ① compilation and analysis of information to quantitatively comprehend and evaluate environmental loads caused by the extraction and use of resources, ② development of inventory required to calculate environmental loads and ③ implementation of joint studies in cooperation with research institutes and international organizations, etc.

3. Indicators on stock of resources accumulated in our nation

In order to establish a sound material-cycle society, it is important to comprehend the current state of “stock” accumulated in our society on top of material flow. In Japan’s material flow, net increase is measured as data from the amount accumulated each year for resources categorized into earth and rocks, metals, biomass and fossils (plastics, etc.). In the future, we need to build a so-called “stock-based society” that accumulates an abundance of usable resources from among the above-mentioned resources, which should produce affluence for us. For example, we can classify social stocks from the aspect of whether or not they have ① utility value or ② recyclable value, and then we should increase positive high-value stock for use while we need to appropriately dispose of and control negative low-value stock becoming potential waste.

As such, from the perspective of promoting the formation of a stock-based society from now on, we need to make a further review of indicators that could be used to indicate the amount of stocks accumulated in our nation by category and their utility value, while proceeding with the categorization of stocks.

4 Indicators for international efforts

It is important to promote international operations of our nation's recycle industries including venous industry, in order to make use of the 3R technologies to establish a sound material-cycle society on a global scale, thereby contributing to the development of Japanese industries and to the economic growth. To this end, we will make a further review of indicators that could measure such progress.

Chapter 4. Cooperation amongst entities and their expected roles

Section 1. Cooperation amongst entities

In order to establish a sound material-cycle society, a variety of entities such as citizens, government, businesses and NPOs, etc. need to fulfill their expected roles, respectively. However, for these entities to leverage their knowledge and wisdom to the maximum and to engage in ongoing and sustainable efforts, they need not only to work independently, but also to cooperate and collaborate with one another to address the issues facing us.

Especially, in the process of development and implementation of measures by the government and local public bodies, we need to take care so that each entity can closely cooperate and take part in the endeavor. In international efforts, it is crucial for the public and private sectors to come together to share information and exchange ideas.

With these in mind, the government needs to facilitate cooperation not only amongst related government offices and ministries, but also with other related entities such as local public bodies, businesses and NPOs and to collect and organize advanced case studies of successful such cooperation to widely disseminate the information.

Section 2. Expected roles of entities

The roles expected for the national government and for other entities are as follows:

(1) State

The government will work on comprehensive efforts towards establishing a sound material-cycle society throughout the nation by growing partnerships with other entities and by making the introduction and revisions of various measures, such as regulatory and economic, as needed.

In such case, while securing sufficient cooperation amongst related government offices and ministries, the government needs to make appropriate application of various legal systems and effective and efficient implementation of related projects in a united manner, subject to the Basic Environment Law (Law number 91 of the year 1994) and the Basic Act.

Further, the government will take initiative and act, as a business operator, to establish a sound material-cycle society by prioritizing to procure “Reuse” and “Recycle” products through green purchasing and green contracts, etc.

(2) Local public bodies

Local public bodies play a critical role in establishing a sound material-cycle society in local regions, by creating local recycling zones, etc., and are expected to play an important role in making appropriate execution and disposal of waste as a coordinator among related entities.

Specifically, prefectural governments are expected to perform a function to coordinate municipalities in their jurisdiction from a broad viewpoint, and municipalities are expected to build a community-based recycling system associated closely with local residents’ lifestyle, respectively.

For example, the following efforts will promote the development of a sound material-cycle society in each local region and lead to the reduction of environmental loads; ① Strict enforcement of sorted collection of waste, ② Reduction of waste through enforcement of paid services for municipal waste treatment, ③ Introduction and public release of waste accounting, ④ Further promotion of recycled use and heat recovery of municipal waste such as food waste, which is far from being recycled for use, ⑤ Promotion of domestic recycled use of waste PET bottles that have been collected based on the Container and Packaging Recycling Law, ⑥ Active utilization of circulative resources such as biomass within a local region, ⑦ Appropriate management and monitoring of toxic substances, ⑧ Provision of environmental education and environmental learning opportunities in a local region, ⑨ Recommendation for and dissemination of information on environmentally friendly green products and services and local made products, ⑩ Provision of guidance and training for waste treatment and “Reuse” and “Recycle” business operators within a local region and ⑪ Provision of guidance for entities engaged in illegal waste treatment.

On top of this, as is the case with the government, local public bodies are expected to take initiative and act to establish a sound material-cycle society by prioritizing to procure “Reuse” and “Recycle” products through green purchasing and green contracts, etc., as a business operator and from the viewpoint of promoting environmental conservation and industrial development.

(3) Citizens

Citizens should behave in a disciplined manner, recognizing that they generate waste and are responsible for environmental loads they cause while they are part of the force to establish a sound material-cycle society, and need to work on changing their lifestyle to a lifestyle causing less environmental loads.

Looking upon citizens as consumers, the Law on Promoting Consumer Education (Law number 61 of the year 2012) which came into effect in December 2012 also stipulates as follows: Consumers should aspire to establish a society (consumer citizenship society) where they mutually respect the characteristics of each other as well as the diversity of consumer lifestyles, realize that their consumer lifestyle and activities are prone to influence social and economic situations in and outside of Japan and the environment of our planet, now and in future generations, and actively participate in building a just and sustainable society.

As such, environmental loads will be reduced by the accumulation of efforts such as; ① Reduction of waste generation and implementation of sorted collection, ② Appropriate treatment of waste and waste home appliances through designated routes, ③ Use of “my bags” and “my bottles” and reduction of containers and packaging through selection of refill products, less packaging and “reuse” bottles, etc., ④ Reduction of food loss by using up all foodstuffs and restraining excessive freshness consciousness, etc., ⑤ Active utilization of rental, lease, and used products, ⑥ Priority purchase of products that use recyclable resources such as timber and recycled goods.

In order to make a sound material-cycle society actually established in local regions, each local resident needs to hold interest in the local environment and circulative resources, actively take part in environmental education, environmental learning and environment conservation activities and collaborate with activities initiated by private bodies such as NGOs and NPOs.

(4) NGOs and NPOs, etc.

Private bodies such as NGOs and NPOs are expected to engage in such local activities as ① Assistance on readjustment of local citizens' lifestyles ② Environmental conservation activities in the local region, such as promotion of the 3Rs, ③ Promotion of community business in the local region, ④ Implementation of environmental education and environmental learning, etc. in the local region, thereby making them a force that contributes to activities intended to establish a sound material-cycle society, as well as to act as a connecting agent for cooperation and collaboration amongst other entities.

(5) Academic and research institutions such as universities

Academic and research institutions such as universities are expected to enhance their academic and specialized knowledge, and provide objective and reliable information in an easy-to-understand manner, thereby enabling each entity to take concrete action.

Moreover, they are expected to assume the role of connecting entities for cooperation and collaboration and to actively engage in environmental conservation activities in the local region, by leveraging their academic and specialized knowledge

(6) Businesses

① Manufacturers and retail businesses, etc.

Manufacturers are expected to fulfill their social obligations that are crucial to sustainable development, by performing their business activities with due consideration to the environment and, especially, to assure legal compliance and prevent illegal dumping and illegal treatment subject to the responsibility of waste generator.

In accordance with the extended producer responsibility, they are also expected to contribute to measures for appropriate cyclical use and disposal after products become waste, and to make efforts for disclosing information and securing transparency.

Environmental loads from business activities will be reduced if the manufactures proceed with such efforts as ① Strict enforcement of design for environment, ② Replacement of disposable products with products for repetitive use, ③ Promotion of less packaging, ④ Reduction of plastic shopping bags, ⑤ Promotion of recycling, ⑥ Efficient use of resources and energy and ⑦ Promotion of green purchase and green contracts, etc.

Above all, strict enforcement of design for the environment is important. If the weight of products is reduced at the manufacturing stage, the amount of resources input and waste generation will be reduced as much. Labeling products with the materials and designing for easier scrapping will also lead to efficient "Reuse" and "Recycle".

Further to efforts by individual businesses, it is also important to get business organizations to make efforts. On top of the reduction of final disposal amount that has progressed through past efforts, it can be expected that the corporate efforts will be further promoted collectively as the whole industry by setting such targets as resource productivity by industry.

Retailers are business operators close to consumers and therefore are expected to make contributions to the reduction of, especially, municipal waste. For example, waste generation from households and offices can be reduced by such efforts as ① Active sales of “Reuse” and “Recycle” products, ② Promotion of less packaging, ③ Collection by shops of milk cartons, food containers and small home appliances and ④ Recommendation for use of “my bags”.

② Waste disposers and recycle operators

Waste disposers, while assuring the conservation of the living environment and the improvement of sanitary environment, are expected to regard waste as valuable resources and actively collect usable resources from among the waste for cyclical use. Further, certified waste disposers, subject to the Certification System for Good Practice Disposers in the Waste Management and Public Cleansing Law, are expected to actively disseminate information, whereas waste-discharging enterprises are expected to preferentially select such certified disposers for their waste treatment.

With regard to technologies related to waste treatment and recycling, the waste disposers are expected to advance such technologies further while appropriately managing them as intellectual property. On the other hand, basic and versatile technologies are expected to be shared so that as many business operators as possible will be able to utilize such technologies.

Further they are also expected to make contributions to the advancement of waste management and 3R technologies in foreign nations including Asia.

③ Financial institutions and investors

Financial institutions and investors are expected to finance the companies and NPOs that work on establishing a sound material-cycle society and projects that will lead to such a society.

Also, the financial institutions are expected to fully utilize their consulting skills and play a role as a connecting agent among different entities doing locally-based business, such as waste-discharging enterprises, recycle operators and user businesses of recycled products, in an effort to establish local recycling zones.

Chapter 5. State initiatives

Section 1. Basic direction of initiatives

Giving due consideration to issues described in Section 2 of Chapter 1, the government will focus on implementing measures for a recycling-oriented society in order to establish a sustainable and sound material-cycle society as set forth in Chapter 2.

Specifically, given that constraints are expected to be strengthened on fossil resources and useful metals around the world and that it has been more important to establish a safe and secure flow of circulative resources, we will proceed with measures as described below, with an eye not only on the amount of cyclical use that has been improving hitherto, but also on the advanced use and securing of circulative resources as well as the quality of circulation, such as securing safety and security.

In this connection, it may be said that, with regard to waste, we will develop necessary measures, as far as it is technologically and economically viable and according to such an order of priority as stipulated in the Basic Act (① Reduction of generation, ② Re-use, ③ Recycled use, ④ Heat recovery and ⑤ Appropriate disposal). However, as stipulated in the Basic Act, a more appropriate method shall be selected in the case that environmental loads can be more reduced by not working along this priority.

Further, in implementing such measures, the government shall cooperate with different entities, such as local public bodies, NGOs/NPOs and private businesses.

- ① Strict enforcement of recycling and appropriate treatment and design for the environment at the production stage will continue to be promoted, subject to the responsibility of waste-generator and the extended producer responsibility, respectively.
We will also pursue efforts for establishing a social and economic system where 2R efforts can be further promoted.
- ② Considering waste to be valuable resources, we will promote effective use of resources such as recovery of useful resources from waste and utilization of waste as energy sources, and strengthen the viewpoint of securing resources. In addition, Japan will actively promote the import of such waste that is difficult to treat appropriately overseas but is regarded as highly valuable from our resource strategy.
- ③ Efforts should be expanded in terms of safety and security, such as for contamination prevention and appropriate treatment of hazardous substances, enhancement of waste treatment system, information sharing of hazardous substances, promotion of communication and understanding among the parties concerned and strengthening of border control measures for improper exports and imports.
- ④ The government will endeavor to integrate efforts to form a sound material-cycle society with efforts for building a low-carbon society co-existing with the nature, keeping in mind that the efforts for a sound material-cycle society will make contributions to achieving a) the target for countermeasures for global warming or a 80% reduction of GHG emissions by 2050 and b) the Aichi target (The Strategic Plan of the Convention on Biological Diversity), a global target concerning bio-diversity.

- ⑤ In order to establish regional recycling zones, we will promote to create a system where cyclical use can be performed on an optional scale for circulative resources that are suited to be cyclically used within a certain region, focusing on characteristics of the region and connections amongst local residents residing in that region.
- ⑥ Green innovation will be promoted and the development of the recycle industry will be encouraged.
- ⑦ In implementing and revising individual laws related to waste management and recycling, we will do so in a comprehensive and planned manner, taking into consideration the contents of this Fundamental Plan, such as promotion of 2Rs (“Reduce and “Reuse”), collection of usable resources and securing of safety and security, while keeping in mind mutual relations among the individual laws.
- ⑧ We will actively promote international efforts for establishing a sound material-cycle society in developing nations including Asia, as well as on a global scale. Further, we will actively support overseas operations of the Japanese recycle industry in an effort to associate with the above international efforts.

Section 2. Domestic efforts

1. Establishing a sound material-cycle society with an eye on “quality”

(1) Establishing a social and economic system where 2R efforts can be encouraged

We will proceed with measures, aimed at establishing a social and economic system where 2Rs (“Reduce” and “Reuse”) can be further encouraged, which is prioritized over “Recycle”, as follows:

- ① In order to promote the 2Rs as part of a social and economic system, we will look into the possibility of incorporating specific 2R efforts that citizens and businesses should carry out into the system.
- ② In order to accelerate 2R efforts, we need to promote measures being actively carried on by “upstream” businesses, such as reduction and lightening of containers and packaging, development of products intended for long-time use and utilization of returnable containers, while taking note of social costs in addition to encouraging “downstream” consumers to drastically change their lifestyle. To this end, we will work on developing a system where private businesses that engage in such efforts can be socially recognized.

We will also examine what the partnership should be like amongst consumers, businesses, NPOs and local public bodies in the region, which could continuously have effects on consumer behavior.

- ③ We will position "Reuse" as one of the main recycle industries, and develop an environment where consumers can comfortably use "Reuse" products. To develop such an environment, we need to strictly enforce legal compliance to prevent inappropriate activities by businesses, such as selling stolen items, and to guarantee the performance of "Reuse" products so that such products may get widely utilized, thereby leading to a sound business market.

We will also support advanced efforts by businesses as a social experiment, with a view to creating and establishing symbolic case studies where such efforts for the 2Rs conform to economic activities and can be performed on a commercial basis.

- ④ In an effort to "make the results of 3R activities visible", we will concisely put together and disseminate information on 3R activities which consumers and retailers and other businesses can actually work on and the ensuing effects in an easy-to-understand manner. Further, to make it an incentive to perform such efforts, we will work to get the results of such 3R activities readily utilized for sales promotion by the concerned businesses and their environmental reports.
- ⑤ We will make use of the citizens' "Mottainai" culture and awareness so that both consumers and businesses can cooperate in improving through the entire food chain by, for example, reducing food waste or containers and packaging.
- ⑥ We will promote the operation of the long term supreme residence certification system, and the application of special taxation measures for certified long term supreme housing construction in order to build up high quality housing stocks that can be used for a long duration of time.

(2) Collection of useful metals from end of life products.

In Japan, metal resources such as steel and aluminum, which are used in large volume and are readily sorted into a single material, are being relatively well recycled, whereas the recycling system for precious metals and rare metals, etc. has not been sufficiently developed yet. Thus a great deal of precious and rare metals, once discharged as waste, is being disposed at landfill sites.

As such, in order to make active use of useful metals contained in end-of-life products, thereby to contribute to the securing of resources and the reduction of natural resources consumption, we will put into implementation measures, as follows:

- ① In order to get as many regions and businesses as possible to take part in a framework stipulated in the Law for Recycling of Small Size Home Appliances, and to have the framework established as one of the main recycling systems, whereby the recycling rate will go up across the nation, a result partly caused by the other ongoing efforts as well, the government will: a) provide assistance to local public bodies in order to establish a collection system led by municipalities, b) encourage the spread and enlightenment of the purpose and effects of the framework and c) promote the cooperation and partnership amongst the concerned entities.
- ② Based on the measures entitled “Concerning the modality of cyclical use of useful metals from end-of-life products”, which were put together in 2012 to encourage the recycling of rare metals collected from a broad range of major products that contain rare metals, such as next-generation automobiles and cemented carbide tools, we will steadily proceed with measures toward securing a larger amount of collection and enhancing the efficiency of recycling.
- ③ In line with the concept of extended producer responsibility, we will proceed with measures at the product design stage, including labeling raw materials used in parts for easy reference and unitizing parts and components, and efforts by manufactures and recycle operators for sharing information on useful metals contained in the products, while taking due consideration to corporate secrets, whereby sorting and recycling by material or resource can be easily done. For end-of-life products, we will keep recycling in a broad area in mind and utilize, as appropriate, the certification system for cross-jurisdictional waste treatment subject to the Waste Disposal Law, where the manufacturers of products are required to collect the end of life products.
- ④ We will support research and development of new technologies needed to collect useful metals from end-of-life products and recycle.

(3) Promotion of advanced recycling such as horizontal recycling

On top of recycling efforts to date which have placed an emphasis on quantity, if horizontal recycling (Reference 28) can be widely performed, it will lead to further promotion of sustainable utilization of resources. Horizontal recycling is intended to enhance recycling quality in response to characteristics particular to each material so that an end-of-life product can be used as the material to produce the same type of product.

It is also important to provide information to consumers on how sorted circulative resources are being utilized to encourage their further efforts.

As such, we will take measures shown below, in order to reduce social costs and get advanced horizontal recycling established in our society, which produces high added values.

In promoting such recycling, we need to put importance on the viewpoint of LCA (Life Cycle Assessment) (Reference 29), where recycling would not end up with heavier environmental loads through a substantial increase in the consumption of required energy, with due considerations to the balance with global warming measures.

- ① We will promote cooperation between industries that supply circulative resources and industries that use circulative resources, aimed at growing demand for products using circulative resources as raw materials, and facilitate spreading and enlightening activities about such products for the consumers.
- ② We will provide assistance to research and development on new technologies for high value-added recycling and reduction of recycling costs such as for sorting, scrapping, and separating.
- ③ We will disseminate information to get the consumers to comprehend how circulative resources are being collected and used, thereby to promote the enhancement of their 3R activities.

(Reference 28) Horizontal recycling

A form of recycling where the parts of an end of life product are used to produce the same type of products. If the amount of energy consumed for recycling and its residue can be reduced, it should be highly sustainable as the materials can be repeatedly used to produce the same type of products. In order to spread this type of recycling, we need to develop solid collection routes for recycling and reduce recycling cost and energy consumption. Currently, glass bottles, aluminum cans, PET bottles, polystyrene food trays and automobile bumpers, etc. are being horizontally recycled in Japan.

(Reference 29) LCA (Life Cycle Assessment)

A method for quantitative and objective evaluation of resource and energy input, environmental loads and the ensuing effects on the earth and its ecological system through all stages from extraction of resources to manufacturing, use, discharge and transportation and all other phases pertaining to a certain product.

(4) Development of appropriate treatment system for waste including hazardous substances

In light of the reality that people have been more aware of safety and security than ever before, prompted by the Great East Japan Earthquake, we will proceed with the following measures to form a sound material-cycle society where safety and security is surely ensured:

- ① We will enhance our current system to make it possible to ensure an appropriate management and treatment of waste containing hazardous substances such as asbestos and PCB.
- ② We will work to develop and spread technologies that allow us to evaluate hazardous effects of waste containing chemical substances, including unintentionally-generated waste, and to appropriately treat such waste.
- ③ We will promote safe and secure recycling by developing criteria for contamination status of hazardous substances and creating effective management methods for recycled materials, with due consideration to the relevant international trends.

- ④ We will further discussions so that a framework for managing such municipal waste that cannot be disposed of by municipalities (hard-to-manage waste articles) can be developed, with the division of roles assumed by concerned entities.
- ⑤ We will proceed with measures for environmentally sound management and disposal of mercury waste, taking into account the international negotiations of the Convention on Minamata mercury in progress.
- ⑥ Based on the Stockholm Convention on Persistent Organic Pollutants (Reference 30), we will provide assistance to prefectural governments on drawing up disposal plans for agricultural chemicals stored underground and prevention measures for harmful effects on the surrounding environment.
- ⑦ While gathering information on hazardous substances, including on the international trends, we will adequately implement risk communication (Reference 31) so that information can be shared and mutual understanding amongst the concerned parties can be developed.

(Reference 30) Stockholm Convention on Persistent Organic Pollutants

A convention which stipulates the elimination of production and reduction of generation of persistent organic pollutants (POPs: Persistent Organic Pollutants), such as polychlorinated biphenyl (PCB) as well as appropriate treatment of waste containing such pollutants. POPs are persistent in the environment and bio-accumulative and highly toxic to people and life, and therefore their long-distance migration is a concern. The contracting members of the Convention are supposed to regulate such pollutants by national laws and regulations, respectively, to be able to secure the Convention.

Measures for the management of toxic chemical substances and waste, etc. were so far taken in line with the Basel Convention and the “Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade” in addition to the Stockholm Convention but, since the three conventions share the purpose of protecting health and the environment from toxic chemical substances and waste, the tighter cooperation and collaboration amongst the three conventions has been being considered to implement more effective international measures.

(Reference 31) Risk Communication

Risk communication is to facilitate dialogues among all concerned entities, such as government, business operators, citizens and NGOs, etc. to share information and exchange views on the magnitude of environmental risks caused by chemical substances, etc., and on feelings, thoughts and countermeasures toward such risks, thereby to build and promote mutual trust and understanding.

(5) Bolstering the waste disposal system at disaster times

At the Great East Japan Earthquake, the disposal of vast amounts of disaster waste, caused by the earthquake and ensuing tsunami, became a serious social problem.

At times of large disasters, the stricken area becomes widespread and lifelines and transportation are likely to be cut off so that even regular collection and disposal of municipal waste gets difficult to perform. At the Great East Japan Earthquake, not only public facilities of local public bodies but many private businesses played an important role in striving to contribute to the disposal of disaster waste. It gave us an opportunity to recognize the importance of community-based waste disposal business operators once again.

In order to promptly and appropriately respond to large scale disasters, which can occur again in the future, it is important to have a disaster time waste disposal system prepared at normal times, such as disaster-targeted measures at waste disposal facilities.

As such, we will promote the following efforts to prepare for possible large-scale disasters.

- ① We will make a reliable analysis on how we have disposed disaster waste caused by the Great East Japan Earthquake, including materials for reflections and, based on the results of the analysis, will fully revise our current policy on disaster waste disposal measures and draw up a new policy, so that we can take measures according to the scale of the disaster (stage) and the corresponding situation.
- ② To prepare against a large scale disaster, we will promote measures, including inter-jurisdictional cooperation, as follows: a. Cooperation amongst local public bodies; b. Cooperation with private business operators etc.; c. Securing tentative storage locations, so that disaster waste can be promptly disposed.

When a large-scale disaster actually occurs, we will sufficiently cooperate with different entities such as local public bodies, and provide appropriate and prompt assistance to these entities.

On implementing recovery and reconstruction projects, we will strive to actively use recycled materials and construction by-products generated from disaster waste.

2. Integrated efforts for establishing a low-carbon society and a harmonious co-existence society.

We will work on cross-sectoral measures as shown below, along with efforts for upgrading local recycling zones, in order to increase synergy effects with efforts for establishing low-carbon and harmonious co-existence societies.

- ① We will promote 3R efforts from the viewpoint of contributing to efforts towards a low-carbon society, and work on strict enforcement of heat recovery from residual waste that still remains after such efforts through the introduction of waste power generation, etc. so that we can further reduce green house effect gas emission from the waste sector while supplying more energy. To this end, we will promote the development of heat recovery facilities such as waste power generation facilities as stated in 4 (2).
- ② We will promote recycling of biomass type circulative resources to use as raw fuels or for heat recovery such as waste generation, thereby to reduce green house effect gas emission from the fossil fuel sector.
- ③ In order to promote sustainable use of recyclable resources in the world of nature, we will promote the use and utilization of biomass resources, subject to the Fundamental Plan for the Promotion of Biomass Utilization (Cabinet decision on December 17th, 2012).
We will also work on reviving forest and forestry, through intensive forest management and accelerated development of forest roads and human resources, thereby to promote appropriate maintenance and conservation of forest and utilization of timber, based on the Fundamental Plan for Forest and Forestry (Cabinet decision on July 26th, 2013).
- ④ We will promote efficient and long term use of resources to hold down the consumption of new natural resources, from the viewpoint of reducing effects on biodiversity and the natural environment in extracting resources. We will also take due care on the conservation of biodiversity and natural environment in the production and extraction of resources, as well as in locating and operating facilities that use renewable resources.
- ⑤ Recognizing that the agriculture, forestry and fisheries industry is an industry involving production activities such that we work with the nature, aptly use it and promote its circulative use to benefit from its wealth, we will promote sustainable activities in agriculture, forestry and fisheries by focusing on environmental conservation oriented agriculture using less chemical and compound fertilizers and environmental conservation oriented aquaculture contributing to the enhancement of fishing ground environment.
We will also promote the utilization of resources not being used currently in farming and mountain areas, such as rice straw and the vegetation resources that are generated through the utilization and management of *satochi* and *satoyama*.
- ⑥ We will work to smoothly promote “Reuse” and “Recycle” as well as appropriate disposal of end-of-life products and equipment used for renewable energy, such as solar panels and wind power generation equipment, which are expected to be introduced in large amounts in the future.

- ⑦ “Reuse” and long term use is generally desirable. However, the energy consumption efficiency of home electric appliances has greatly improved in recent years, and there are instances where “Reuse” and long term use will lead to larger energy consumption. For this reason, we will consider drawing up guidelines that can serve as references for “Reuse” and longer term use so that such practices can be effectively balanced out to reduce environmental loads.
- ⑧ We will promote the conservation, regeneration, and creation of satisfactory marine environment by making effective use of earth and sand generated through the development of sea routes, regenerating tideland and seaweed beds and refilling deep drilling sites (Reference 32) to improve water quality and secure biodiversity.

(Reference 32) Deep drilling sites

Large scale sea gravel excavation sites created as a result of past extraction of underwater earth and sand to be used as landfill materials and concrete aggregates. There are cases where oxygen-deficient waters (water mass with extremely low oxygen saturation) or blue tides occur due to the deterioration in seawater exchange and decomposition of organic matter. As a result of these, it is known that the quality of water and sea bottom sediment is deteriorating and impacting the habitat and growth environment of living organisms.

3. Advancement of local recycling zones.

In order to establish local recycling zones, we have been working on the formation of a system where circulative resources can be recycled on an optimal scale according to the type of resources through development of guidelines and through model projects based on the Second Fundamental Plan for Establishing a Sound Material-cycle Society. In the future, we need to extend and develop such efforts for actually creating local recycling zones in various parts of Japan, while putting together the concept of coexistence zones for people and nature as indicated in the National Strategy for the Conservation and Sustainable Use of Biological Diversity (2012-2020).

As such, we will promote the following measures to establish and advance local recycling zones in cooperation with concerned entities in each region, such as local public bodies.

- ① We will bring in the viewpoint of creating local recycling zones as part of our ongoing efforts toward creating local communities, while collaborating in proceeding with efforts toward establishing a low-carbon society and a harmonious coexistence society, waste disposal plans in different regions, eco-town projects, action plans by local public bodies (Reference 33) subject to Act on Promotion of Global Warming Countermeasures (Law number 117 of the year 1998), efforts based on the Biomass Industrialization Strategy (approved by the Biomass Utilization Promotion Committee on September 6th, 2012), efforts on “Midori no Bunken Kaikaku” (growth strategy from the local region aimed at promoting local sovereignty throughout society) and measures for recovery from the Great East Japan Earthquake.

We will also work on actually creating and advancing local recycling zones in various parts of Japan by cooperating and collaborating with local public bodies, local business operators, NPOs and citizens, etc.

- ② With regard to collaboration with global warming countermeasures in local regions, it is clearly stated in the Law Concerning the Promotion of the Measures to Cope with Global Warming that a sound material-cycle society shall be established, as a global warming countermeasure that local public bodies should address, and efforts for establishing local recycling zones are already in action.

Based on such collaboration, we will promote to establish low-carbon communities that are suited for each of local recycling zones. For example, we will provide support for introducing self-reliant or decentralized energy systems utilizing biomass circulative resources from agriculture, forestry, stock-breeding and fisheries in agricultural, mountain and fishing villages and, in metropolitan and suburban regions, fully enforcing circulative use of resources and heat recovery at incineration facilities. Through such efforts, we will promote the introduction and broad use of self-reliant and decentralized energy, thereby to encourage cooperation amongst a broad range of concerned personnel for the vitalization and independence of their regions and create appropriate and efficient resource circulation utilizing local resources.

- ③ With regard to biomass circulative resources, while encouraging the cooperation of concerned parties and entities in the local region, we will provide assistance to efforts for cyclically using such resources as fertilizer, feed and renewable energy, which includes an initiative to establish a biomass industrial city that is environmentally friendly and disaster resistant through the development of green industries and a regionally recycling energy system utilizing regional biomass, subject to the Biomass Industrialization Strategy.

Further, regarding agricultural produce using fertilizers and feed made from food waste, we will make efforts to elevate the needs for such fertilizers and feed by branding the products as part of our efforts towards establishing the sixth industry that creates new values utilizing local resources, and to appropriately certify food recycle loops based on the Law Concerning the Promotion of Recycling Food Cyclical Resource.

- ④ Regarding product-type circulative resources and circulative resources containing exhaustible resources, we will appropriately utilize the certification framework for broader areas as well as the certification framework for recycled use, subject to the Waste Disposal Law, keeping in mind that they are cyclically used in cross-jurisdictional areas.

We will also work on effectively utilizing recycling facilities developed through eco-town projects and promoting the cooperation between collectors and users of circulative resources.

- ⑤ Building on a change in local residents' awareness caused by the Great East Japan Earthquake and their experiences, we will support recovery projects in the Tohoku region, which utilize local circulative resources to the maximum, and promote the formation of local recycling zones that can become case models across the nation.

- ⑥ From the viewpoint of providing cross-sectional assistance towards the establishment of local recycling zones, including the efforts cited above, we will work to spread and enhance the guidelines for promoting the establishment of local recycling zones. Also, we will assist comprehending the amount of available local resources and the flow of circulative resources both of which can be utilized for the creation of local recycling zones, collect and provide information on advanced case studies on the establishment of local recycling zones and develop the advisory system relating to the establishment of local recycling zones.

(Reference 33) Action plan by local public bodies (local measures version)

A plan drawn up by local public bodies, based on Article 20 part 3 of the Law on the Promotion of Global Warming Countermeasures, which defines measures to reduce green house effect gas emission in specific regions according to their environmental and social conditions. The development of such plans is mandated on local public bodies and ordinance-designated cities. The establishment of a sound material-cycle society is stipulated in the plan, as a statutory entry by the same law (Law Concerning the Promotion of Global Warming Countermeasures, Article 20, part 3, Section 3, Clause 4).

4. Using circulative resources and biomass resources as energy source

In consideration of the lack of electricity in many parts of Japan and the re-evaluation after the Great East Japan Earthquake of our energy and environmental policy heavily dependent on nuclear power hitherto, we will put more importance on the role played by circulative resources that can be stably supplied, as well as the role played by biomass resources in energy supply through heat recovery and conversion to fuel.

However, the power generation efficiency and the percentage of residual heat used at waste disposal facilities are low, and therefore we need to work on bringing these up.

Regarding biomass resources, we also need to work on making efforts for technology development and stable supply, thereby to establish an integrated system that encompasses the entire flow from production of raw materials to extraction, transportation, production and use of biomass resources, while focusing on specific issues that need to be addressed.

As such, we will work on measures shown below, in addition to the efforts presented in 2 and 3, while leveraging the independency, originality and creativity of each region.

- ① In order to advance heat recovery from waste power generation, we will work on measures as follows: a. Prompt installation of high efficiency waste power generation facilities by local public bodies; b. Examination of measures for elevating efficiency of waste power generation; c. Promotion of improvement of facilities for high efficiency waste power generation involving private business operators; d. Diffusion of the certification system for entities equipped with waste heat recovery facilities; e. Improvement of the fixed price purchase system for better utilization, such as development of manuals.

- ② We will work on effective use of mid to low heat generated at incineration facilities and in the process of industrial activities, aimed at regional air conditioning, etc.
- ③ We will promote production of bio fuels, bio-gasification where methane is collected from food waste at high efficiency, generation of bio diesel fuels from collected waste cooking oil, pelletizing of thinned woods and solid fuel processing of organic sludge. We will also further research and development of technologies that contribute to these efforts.
- ④ We will promote efforts to enhance energy recovery efficiency by making sewage treatment facilities a base of biomass utilization for energy recovery and by mixing different types of biomass such as sewage sludge and food waste to use.

5. Development of the recycling industry

(1) Development of quality business operators that seek effective utilization of waste, etc.

To date, the waste disposal industry was focusing on the disposal of waste that had been generated. However, in order to develop the recycling industry, we need to look at waste as valuable resources, step ahead of simple waste disposal and speed up the transformation of the industry to a business structure where the disposers actively engage in recycling such resources.

To this end, we will work on measures as shown below, on top of the efforts described in 1.

- ① Regarding industrial waste disposal, we will work on diffusing the certification system for supreme industrial waste disposers and the certification system for business operators equipped with waste heat recovery facilities, and beefing up communication on good practice case studies, in order to create an environment where good practice business operators will be socially recognized and business operators who engage in illegal dumping and inappropriate disposal will be driven out of the market.
- ② We will work on expanding efforts where manufacturers and recycling operators come together to increase the use of recycled raw materials, while promoting design for the environment and enhancing resource productivity.
- ③ We will promote efforts for fostering supreme “Reuse” business operators and for ensuring the quality of “Reuse” products so that the “Reuse” market can be expanded.
- ④ We will improve the quality and safety of recycled products using circulative resources, and work on branding them to enhance their competitiveness.

We will promote efforts on environmental labeling such as eco-mark, which provides and displays information on the quality, safety and expected reduction of environmental loads of “Reuse” and “Recycle” products for easy recognition.

- ⑤ The government will take the initiative in carrying out green purchase and green contract, putting an emphasis on “Reduce” and “Reuse” to procure 3R products and actively using environmentally friendly services and renewable energy.
- ⑥ In order to make waste disposal by local public bodies more transparent, we will work on the diffusion of the accounting standards for municipal waste.
- ⑦ We will promote business operators’ efforts to adopt environmental management systems, develop and disclose environmental reports and environmental accounting, etc.
- ⑧ We will utilize tax incentives to promote the development of appropriate waste disposal facilities.

(2) Establishment of venous logistics systems

With regard to the transportation of waste and recycled resources and products, the long-distance-transportation is expected to increase in large quantity, due to an increase in the number of recycled items, the improvement of cyclical use rate and an increase in exports and imports of circulative resources in accordance with the economic development in the Asian region.

For this reason, we need to promote the formation of an efficient venous logistics system offering appropriate treatment and transportation by locating waste and recycling facilities in concentrated areas and developing functional relations amongst such areas.

As such, we will work on measures as shown below, in order to further reduce environmental loads and transportation costs arising from venous logistics.

- ① We will promote the circulation of domestic and international resources by designating hub ports for venous logistics as recycle ports and getting cross jurisdictional recycling facilities located in coastal areas, while driving cooperation between the public and private sectors and providing comprehensive assistance for the development of port facilities.

- ② We will promote modal shift, aimed at changing the means of transportation from road transportation to rail transportation and shipping, both generating less environmental loads.
- ③ We will work on advancing a trans-regional utilization promotion system for port construction resources (Super phoenix), where soil arising from construction sites in the Tokyo metropolitan area can be used to develop premises for ports in other parts of Japan.
- ④ We will examine measures to further reduce costs caused by venous logistics while ensuring appropriate operation of the Waste Disposal Law.

6. Appropriate disposal of waste.

(1) Measures against illegal dumping and inappropriate disposal

We will work on the following measures to address illegal dumping and inappropriate disposal.

- ① While appropriately enforcing the Waste Disposal Law, we will assess the effects of the 2010 amendments to the Law and consider another amendment, depending on the results of the assessment.
- ② We will provide assistance to local public bodies that are making efforts to pursue the liability of perpetrators by running an illegal dumping hotline whereby it is possible to receive information on illegal dumping and inappropriate disposal from citizens directly as well as by sending specialists on industrial waste to the illegal dumping sites.
- ③ We will cooperate with local public bodies in disseminating and enlightening activities as well as strengthening supervision, which normally take place during the national monitoring week of illegal dumping from May 30th (entitled “go-mi-zero (no waste) day”) to June 5th (entitled “environment day”) every year.
- ④ We will provide appropriate financial assistance for individual incidents of illegal dumping and inappropriate disposal of industrial waste from the funds reserved subject to the Waste Disposal Law. We will continue to provide financial support for measures against unsettled incidents of illegal dumping and inappropriate disposal of industrial waste, which took place before the enforcement of the 1997 amendment of the Waste Disposal Law, pursuant to the Act on Special Measures against the Removal of Problems Arising from Specified Industrial Wastes (Law number 98 of the year 2003). Further, we will provide guidance and assistance to local public bodies so that measures against incidents of illegal dumping and inappropriate disposal of industrial waste can be smoothly executed pursuant to the above legislation.
- ⑤ In order to expand the use of computerized manifest system, which is a control document system used to confirm proper transportation and disposal of industrial waste, we will work on improving the system through the utilization of IT technologies to enhance convenience and pursuing spreading and enlightening activities.

- ⑥ We will strengthen measures against business operators and exporters that collect unneeded items from households without permission to inappropriately dispose and export, by strictly enforcing the Waste Disposal Law and raising citizens' awareness about the concerned recycling system.
- ⑦ Based on the Act for the Promotion of Driftage Disposal for Good Coastal Landscape and Environmental Conservation to Protect Rich and Beautiful Nature (Law number 82 of the year 2009), we will work on measures against seashore driftage such as measures to prevent the generation of driftage. We will also work on collecting waste, etc. drifting on the surface of the sea in closed water areas so that the navigation of ships may not be hindered.

Regarding oil and hazardous liquid substance spills from ships etc., we will execute appropriate prevention and extermination measures, subject to the Act on Prevention of Marine Pollution and Maritime Disaster (Law number 136 of the year 1970).

- ⑧ We will build an advanced environment friendly ship recycle system and develop an executive framework for domestic operation suited to the system. Regarding end of life FRP ships, we will work on raising public awareness and enlightening people on the necessity of recycling and the recycling system being actually operated by the business association.

(2) Securing of final disposal sites, etc.

We will promote the following measures in order to secure final disposal sites.

- ① As for final disposal sites for municipal waste, we will continue to work on securing final disposal sites as needed while forecasting residual space.

We will also provide assistance to efforts for making effective use of landfill waste at disposal sites or reducing the amount of landfill waste.

- ② Concerning final disposal sites for industrial waste, while making it a basic policy to get private business operators to develop their own facilities, we will rely on public organizations such as Waste Treatment Center to develop such facilities in case there is a need to secure appropriate disposal of industrial waste.
- ③ Regarding sea surface disposal sites which are used as final disposal sites for dredge soil from port developments and waste that cannot be cyclically used, we will work on our plan as scheduled in coordination with orderly port development.

- ④ In light of the fact that it is prohibited as a rule to dump waste generated on land and waste oil arising from ships at sea, we will appropriately operate the permit system for ocean dumping of waste, subject to the Law Relating to the Prevention of Marine Pollution and Maritime Disaster, thereby to reduce the volume of ocean dumping and secure the facilities that can appropriately accept waste oil.

7. Responses to individual laws

(1) Waste Disposal Law (Waste Disposal and Public Cleansing Law)

With due consideration to the 2010 amendments to the Waste Disposal Law, we will endeavor steady enforcement of the law and its amendments. The 2010 amendments are based on discussions amongst concerned parties, held for over a year since 2008 at the Central Environmental Council, and the following steps were taken accordingly: Rationalization of the permit system for collecting and hauling operators of industrial waste; Enlargement of authorized waste importers; Creation of a heat recovery certification system; Review of requirements for disqualification; Tightening of penal regulations, etc.

According to the state of enforcement of the revised law, we will continue to take necessary measures to ensure appropriate disposal.

(2) Law for the Promotion of Effective Utilization of Resources

We have worked to promote the use of recycled resources and parts by developing a collection framework for end of life PCs and compact secondary batteries from households in 2003 and making it mandatory in 2006 to provide information on substances contained in home appliances and PCs. Building on these efforts, we will work on further promotion of the 3Rs.

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

With the 2006 amendment to the Containers and Packaging Recycling Law, we put in place such measures as creation of a regular report system for business operators using large volumes of containers and packaging and a funding scheme for municipalities, thereby to reduce waste generation from containers and packaging and to streamline recycling.

As of April 2013, 5 years passed since the complete enforcement of the revised Containers and Packaging Recycling law, and as it has been due for revising the law, pursuant to its supplementary provision, we will perform a review on the status of enforcement and take necessary measures with reference to the results of review.

(4) Home Appliances Recycling Law (Law for Recycling of Specified Kinds of Home Appliances)

An evaluation and review on the enforcement status of the law took place at joint meetings of the Central Environmental Council and the Industrial Structure Council starting in 2006, 5 years after the enforcement of the law in 2001, and the results were put together in February 2008. As a result of the developments, we took action to enforce the addition of liquid crystal display TVs to the group of specified items, enhancement of recycling standards, reduction of recycling fees, sharing of designated collection locations and assistance to measures for illegal dumping.

Since it was indicated as appropriate in the above results to re-examine the framework once again in five years, we will perform assessment on the enforcement status of the framework and take necessary measures with reference to the forthcoming results.

(5) Small Home Appliances Recycling Law (Act on Promotion of Recycling of Small Waste Electrical and Electronic Equipment)

In view of the situation that a large proportion of metals and other useful items used in end of life small home appliances are disposed without being collected, the Small Home Appliances Recycling Law was promulgated in August 2012 and came into effect in April 2013 in order to ensure proper disposal of waste and effective use of resources by taking measures to promote the recycling of end of life small home appliances.

In order to enforce the above framework smoothly, it is important to have a large number of municipalities take part and certified business operators continue to make stable operation. To this end, we will provide assistance to the participating municipalities and certified business operators, thereby to set the framework in place as a new and effective recycling system, so that we can collect and make effective use of as many small home appliances as possible, while continuing to execute other ongoing efforts.

(6) Food Recycling Law (Law Concerning the Promotion of Recycling Food Cyclical Resources)

With regard to food waste, we will promote efforts for reducing food loss from the entire food chain covering the households, while cooperating with local public bodies. As far as food related business operators are concerned, since we set tentative targets for the reduction of food waste generation for 16 sub-categories of food business in April 2012, we will now work on referring to the evaluation of the obtained data and considering a full enforcement including other business groups, with the target year set at around FY2014.

Concerning measures for cyclical use, we will work on increasing recycling in downstream categories of the supply chain (retail and restaurants) as well as in the households, where recycling is still insufficient. To this end, while strengthening cooperation with private recycling operators and local public bodies, we will utilize the fixed price purchase system to promote bio-gasification by methane fermentation for waste that cannot be recycled into fertilizers or feed, from the viewpoint of promoting use of food waste biomass based on the Biomass Industrialization Strategy, in addition to the efforts made hitherto for conversion to fertilizer and feed, thereby to develop a system well suited to the characteristics of the local area, where food and energy can be locally produced and consumed.

5 years passed since the enforcement of the Food Recycling Law in December 2012, and now that it has been due for revising the law, pursuant to its supplementary provision, we will perform a review on the enforcement status, including the challenges as indicated above, and take necessary measures with reference to the results of review.

(7) Construction Waste Recycling Law (Law Concerning Recycling of Materials from Construction Work)

With regard to the Law Concerning Recycling of Materials from Construction Work (Law number 104 of the year 2000), an evaluation and review took place at a joint meeting of the Central Environmental Council and the Panel on Infrastructure Development held in November 2007 and, from the results of evaluation and review put together in December 2008, it was recognized that sorted scrapping and recycling of construction waste had been steadily progressing and that the cyclical use rate for overall construction waste, including specified construction waste, had been developing at a high rate. We have also amended concerned ministerial ordinances based on the said results.

We will continue to promote the strict enforcement of sorted scrapping and recycling of construction waste, thereby to carry out effective use of resources and appropriate disposal of waste. Further, we will promote dissemination and enlightenment regarding construction recycling to strengthen cooperation amongst concerned parties and to encourage sorted scrapping and recycling.

(8) End-of-life Vehicle Recycling Law (Law Concerning Recycling Measures of End-of-life Vehicles)

With regard to the framework for end-of-life vehicle recycling, the situation after the enforcement of the End-of-life Vehicle Recycling Law was confirmed at a joint meeting of the Industrial Structure Council and the Central Environmental Council, leading to the recognition that the framework was successfully functioning as a whole, as evidenced by the achievement of the target cyclical use for automobile shredder residue and drastic reduction in the number of illegal dumping and inappropriate storage.

We will make a check and review of the framework so that it can continue to steadily function, without being influenced by the market trends of iron and steel scrap, under the cooperation amongst the concerned entities who are expected to assume appropriate roles in the process from production to recycling and disposal.

In particular, we will look into considering highly workable countermeasures against illegal dismantling and inappropriate exports, and advancing "Reuse" and "Recycle" in light of the expected increase of next generation automobiles likely to be used in the future, such as hybrid cars and electric cars, which contain rare metals.

(9) PCB Special Measures Law (Law Concerning Special Measures for Promotion of Proper Treatment of PCB Waste)

Based on the “Promotion of Proper Treatment of PCB Waste in the Future” (August 23rd, 2012, Committee on the Promotion of Proper Treatment of PCB Waste), we will develop such measures as promotion of disposal through the reconstruction of disposal facilities for high voltage transformers, ensuring of disposal systems in areas where such systems for stabilizers are currently not available and enhancement of capabilities of disposal facilities for main bodies of low PCB contaminated electronic equipment waste. Through such measures, we will secure a disposal system enough to complete the disposal of entire PCB waste by the end of FY 2026.

(10) Law Concerning the Promotion of Procurement of Eco-friendly Goods and Services by the State and Other Entities (Law on Promoting Green Purchasing)

Ten years have passed since the enforcement of this law, and efforts for green purchasing are steadily developing not only at the government and state organizations but at local public bodies as well.

While continuing to work on the dissemination and promotion of green purchasing, we will appropriately evaluate advanced recycled goods as well as services contributing to a sound material-cycle society, by enhancing, expanding or adjusting the standards in accordance with the social trends.

8. Promotion of environmental education, accurate information sharing and dissemination and awareness raising

(1) Promotion of environmental education

In order to establish a sound material-cycle society, it is important to have each citizen develop a comprehension on the environment and drastically shift to an eco-friendly and sustainable life style.

As such, we will develop measures as follows:

- ① Pursuant to the Law for Enhancing Environmental Education, we will comprehensively promote environmental education and environmental conservation activities in families, schools, workplaces, communities and all other settings, while taking into account the importance of mutual cooperation amongst diverse entities, in order to establish a sustainable society.
- ② In school education, we will further promote environmental education including reference to the formation of a sound material-cycle society in progress, taking into consideration the stage of school children’s development, in line with the government’s revised curriculum guidelines.

(2) Information sharing, dissemination and awareness raising on the the 3Rs

In order to induce the people who are quite aware of the 3Rs to take tangible actions to shift to a 3R-conscious lifestyle, it is necessary to get all citizens to share the latest information on domestic and international situations regarding the 3Rs and on 3R-oriented actions so that they can understand the significance and effects of such actions.

As for efforts for reconsidering a lifestyle of mass production and consumption generating mass waste, it is necessary to encourage close cooperation amongst citizens, local public bodies, NPOs and business entities, etc.

As such, we will proceed with measures as follows:

- ① We will provide up to date information concerning the formation of a sound material-cycle society, publicize the Fundamental Plan and disseminate information on case studies of various efforts toward establishing a sound material-cycle society. We will also designate October as the Month of 3R Promotion and work on further promotion of efforts toward a sound material-cycle society.
- ② In order to propagate the launch of inventive new business and the advanced case studies, we will work on information sharing and networking amongst the entities as follows: a. Local public bodies serving as a core of regional activities; b. Academic and research institutions accumulating various fruits of research; c. NPOs providing concepts and coordination functions; d. Business operators possessing technological information and engaging in production and sales activities.
- ③ In comprehending the current situation towards the establishment of a sound material-cycle society, indicators, such as material flow indicator, and effort indicators presented in this Plan are important and, therefore, we will proceed with measures to further improve the indicators while upgrading and developing data that can back up the improvement.
- ④ We will co-organize a national 3R promotion event together with the 3R Activities Promotion Forum, which is made up of various entities such as local public bodies and private businesses, so that we can raise citizens' awareness and encourage tangible action on their part by introducing various 3R efforts and awarding those who have contributed to the promotion of a sound material-cycle society. In order to put into implementation more precise activities, we will also organize regional 3R promotion events by blocks. We will also work on further raising citizens' awareness and encouraging tangible action on their side, by cooperating with private sector groups such as the "Reduce" "Reuse" "Recycle" Promotion Conference where groups of various areas come together to perform such activities as "Reduce" "Reuse" "Recycle" Promoter Award" jointly with both national and local governments.
- ⑤ We will make efforts for disseminating the 3Rs in general and raising its awareness and encourage collaborative works in which business operators and consumers engage by providing assistance to activities, such as "Promoters of Waste Reduction" subject to the Waste Disposal Law and "Waste Containers and Packaging Reduction Promoters (3R Meisters)" subject to the Containers and Packaging Recycling Law.

Section 3. Promoting international efforts

1. Promotion of 3R international cooperation and support of overseas operation by Japanese recycling industry

In order to build a multi-layered network based on a collaboration amongst a variety of entities such as government, local public bodies, private sector and citizens' groups to establish a sound material-cycle society in developing nations including Asia or on a global scale and, at the same time, to vitalize Japanese recycling industry, we will proceed with measures as follows:

- ① In order to set in place a sound material-cycle society in Asian and Pacific nations with which Japan has strong ties, we will further promote information sharing and consensus building for development of the 3Rs through multilateral frameworks such as Regional 3R Forum in Asia, while encouraging collaboration with international organizations in relevant projects.
- ② In order to enable each of Asian nations to build a waste management and recycling system and a capacity of environmentally sound management (ESM) for hazardous waste, as they think is appropriate to their respective nations, we will promote bilateral policy talks, whereby to support the development of 3R national strategies and/or legislative system for a sound material-cycle society and to facilitate interexchange activities in academic and research fields, while expanding a dispatch of experts to or accepting trainees from Asian nations through JICA, etc.
- ③ We will strengthen the sharing of information and experiences and the collaboration for technological assistance with local public bodies of Asian nations through international cooperation amongst cities initiated by the International Partnership for Expanding Waste Management Services of Local Authorities (IPLA), which was launched with a view to expanding local governments' waste management services. Also, we will work on further information gathering and collaboration concerning international efforts for waste management through the Global Partnership for Waste Management (GBWM). Further, we will facilitate information exchange and cooperation at citizens' level and encourage research and study on international circulation of resources through the 3R Asia Citizen's Forum, etc.
- ④ We will promote to introduce and implement a waste management and recycling system in developing nations through the efforts as shown above, as well as to encourage overseas operation of Japanese venous and other recycling industries in a one-package initiative from the strategic viewpoint. Further, making use of channels with other nations at government and city levels, we will provide assistance to exchanges between private business operators and overseas government officials and proceed with measures for overseas operation based on government-private sector collaboration in collaboration with concerned government office and ministries.

- ⑤ In order to promote tangible efforts indicated in ④, we will provide assistance to feasibility studies on 3R and waste management projects which Japanese business operators are going to perform in Asian nations.

We will also develop platforms to assist overseas operations, and provide assistance to information sharing and cooperation amongst concerned parties trying to promote efforts by the private and public sectors, international dissemination of information on Japan's 3R and waste management technologies as well as presentations and displays at exhibitions being held overseas.

- ⑥ We will provide assistance to the implementation of projects and policies including for waste management, which accomplish the so-called co-benefits (Reference 34) that can contribute to measures for both global warming and environmental contamination issues in developing nations.
- ⑦ In light of the development that the Framework for the Environmentally Sound Management (ESM) of Hazardous Wastes and Other Wastes was adopted at the 11th meeting of the Convention of the Parties to the Basel Convention, we will continue to play a leading role and will support to set the framework in place. We will also actively involve ourselves in the revision of the guidelines for environmentally sound management of mercury waste and the development of other guidelines including for POPs (Reference 35).
- ⑧ We will actively take part in activities by the OECD, the UNEP International Panel on Sustainable Resource Management, UNEP International Environmental Technology Center (IETC) (Reference 36), the Climate and Clean Air Coalition (Reference 37) and the Basel Convention, and make stepped-up efforts to disseminate information internationally so that our strengths and measures can be reflected on the international discussions, such as Japan's framework and technologies for 3R and waste management, efforts towards sustainable consumption and production including "Reuse" and "Recycle" products and the latest expertise and developments on material flow indicators.

According to the SAICM domestic action plan, we will promote activities to strengthen collaboration between the Basel Convention and other treaties for appropriate management of chemical substances and waste, such as the Stockholm Convention and the Rotterdam Convention.

Concerning the sustainable development target (SDGs), the international development target after 2015 (Post-MDGs) and the assessment of the 10 year plan framework on sustainable consumption and production (10YFP), for which it was agreed that the process of future negotiations would begin to be discussed respectively based on a result of the Rio+20 held in Brazil in June 2012, we will actively contribute toward establishing a sound material-cycle society on a global scale and will make efforts to get Japan's expertise on environmental efficiency of resources leveraged.

(Reference 34) Co-benefits

To simultaneously accomplish measures for environmental pollution such as air pollution, water contamination and waste disposal, or the challenges which developing nations are faced with, and the reduction of greenhouse effect gas or a problem caused by the global warming. Efforts targeted for co-benefits are thought to be effective in promoting global warming countermeasures in rapidly growing developing nations.

(Reference 35) POPs

Persistent Organic Pollutants are substances that are toxic, persistent, bio-accumulative and capable of long-distance movement, being referred to as POPs. To address the elimination and reduction of POPs internationally, the Stockholm Convention on Persistent Organic Pollutants (POPs Convention) was adopted in May 2001 and came into effect in May 2004.

(Reference 36) UNEP International Environmental Technology Centre

An institution founded as a UNEP organization in 1992 for the purpose of transferring environmentally sound technology to developing nations. The organization is currently headquartered in Osaka, and mainly works in the waste management area on the improvement of environmental issues in developing nations, the dissemination and promotion of environmentally sound technology, and integrated waste management, etc.

(Reference 37) Climate and Clean Air Coalition (CCAC)

An international partnership founded in February 2012 by the US, Canada, Sweden, Mexico, Ghana and Bangladesh to reduce Short-Lived Climate Pollutants (SLCP) emission. Japan also joined the partnership in April 2012. SLCPs are short-lived greenhouse effect gases and the like, such as black carbon with an appearance similar to soot, methane and chlorofluorocarbon. The reduction of SLCPs emission is thought to be effective for both short term mitigation of climate change and for the prevention of air pollution, and is receiving international attention.

2. Responses to exports and imports of circulative resources

The movement of circulative resources, if carried out appropriately, can contribute to the reduction of environmental loads and effective use of resources, but if the resources are disposed inappropriately where exported, it may cause environmental pollution.

As such, it is important to: ① appropriately dispose circulative resources in Japan as a general rule, and ② facilitate the smooth international movement of circulative resources, depending upon their characteristics, if it contributes to the reduction of environmental loads or effective use of resources.

Accordingly, we will work on measures as follows:

- ① In order to prevent environmental pollution caused by the international movement of hazardous waste etc., we will tighten cross-border measures by strengthening cooperation with the nations participating in the Asian Network for Prevention of Illegal Transboundary Movement of Hazardous Wastes and relevant international organizations and by making a revision of the notification with a view to clarifying the restrictive measures of the Basel Convention.
- ② We will accept waste from overseas that cannot be appropriately disposed in developing nations but can be disposed in Japan, to the extent of not exceeding our disposal capacity, whereby to reduce the impact on the environment and public health in developing nations and to effectively utilize them as resource. For this reason, we will improve guidance for procedures through our website to enable business operators to learn the import procedures of this type of hazardous waste, and will make efforts to shorten the required time by simplifying such procedures as much as possible without conflicting with the Basel Convention.
- ③ For circulative resources such as coal ash and granulated blast furnace (Referance 38), for which domestic usage is limited but there is stable demand available in other nations, we will facilitate smooth exports of such resources by confirming the required after-export disposal procedures by category and taking measures to speed up the procedures, if it can be guaranteed that recycled use would not pollute the environment in the nation we export to.
- ④ In light of the important role that ports play as a gateway in trans-boundary movement of circulative resources, we will work on developing port facilities and a receiving framework for facilitating the movement of resources.

(Reference 38) Coal ash, Granulated blast waste

Coal ash is ash being generated when coal is combusted at coal thermal power plants. Granulated blast waste is a material used in cement and the like, or something that is formed by injecting large amounts of pressure water on liquid slugs (liquid substances unintentionally generated when refining steel, etc.) generated from blast furnaces (steel production facilities using iron ores as materials) to rapidly cool down.

Section 4. Response to the Great East Japan Earthquake

1. Disposal of disaster waste.

With regard to disaster waste caused by the Great East Japan Earthquake, we will steadily work on its disposal in collaboration with the concerned entities, according to the Disposal Policy for Disaster Waste caused by the Great East Japan Earthquake (Master Plan, promulgated by the Ministry of the Environment on May 16th, 2011), the project plan and roadmap for recovery measures and the roadmap for disposal of disaster waste caused by the Great East Japan Earthquake (amended May 7th, 2013).

As for the vast amount of disaster waste and tsunami sediments, we will endeavor to recycle as much of them as possible, for instance, by utilizing as construction materials for projects organized as recovery and restoration works, such as restoration of coastal disaster prevention forests, in cooperation with the concerned parties, thereby to give momentum to building a sound material-cycle society in the region.

Since there is not enough disposal capability in the disaster stricken area, we need to steadily proceed with a broad-area disposal utilizing facilities outside of the disaster stricken areas.

Further, from the viewpoint of disposing disaster waste speedily, the government, when requested by municipalities and if it is deemed to be necessary for the government to get involved, will dispose of the disaster waste in place of the concerned municipalities, subject to the Act on Special Measures Regarding Disaster Waste Disposal (Law number 99 of the year 2011).

2. Disposal of radiation contaminated waste

We will appropriately and safely dispose radiation contaminated waste caused by the accident at the TEP-CO nuclear power plant No. 1, which occurred following the Great East Japan Earthquake, subject to the Act on Special Measures concerning the Handling of Environmental Pollution by Radioactive Materials Discharged by the Nuclear Power Station Accident Associated with the Tohoku District – Off the Pacific Ocean Earthquake that Occurred on March 11, 2011 (Law number 110 of the year 2011; hereinafter referred to as the Act on Special Measures concerning the Handling of Radioactive Pollution), the Basic Policy based on the Act on Special Measures concerning the Handling of Radioactive Pollution (Approved by the cabinet on November 11th, 2011), and the Policy on Future Disposal of Specified Waste (Reference 39) (Released by the Ministry of the Environment in March 2012).

In case of actually recycling waste, we will ensure enough safety with due care to radiation contamination and continue to work under the close cooperation amongst responsible government departments so that the safety of circulative resources other than disaster waste can be secured sufficiently as well.

In this connection, it will be deliberately discussed how we should permanently handle the disposal of radiation contaminated waste within the legislation, after sufficiently assessing the results of waste disposal being currently performed subject to the Act on Special Measures concerning the Handling of Radioactive Pollution.

(Reference 39) Specified waste

Specified waste is waste contaminated with radiation over 8,000 becquerel per kilogram, such as incinerated ash and sludge, which is specified by the Minister of the Environment pursuant to the Act on Special Measures concerning the Handling of Radioactive Pollution.

Chapter 6. Effective implementation of this Plan

Section 1. Cooperation amongst responsible government departments

On measures toward establishing a sound material-cycle society, there are a variety of policy areas mutually relating to each other. Accordingly, in order to efficiently and effectively execute the policies, the government needs to execute such policies in a collective and concerted manner, rather than the concerned government office and ministries alone make efforts, respectively. With this in mind, we will keep liaisons with responsible ministries, always exchange information at both headquarter and regional office levels and proceed with measures in close collaboration with these ministries in the policy areas for which multiple government office and ministries are responsible, such as utilization of biomass resources and assistance to the building of a sound material-cycle society in Asian nations.

Moreover, since it is important to implement measures for building a sound material- cycle society while taking advantage of independency, originality and ingenuity initiated by various entities, we need to proceed with the measures under the collaboration of all parties concerned, including not only government office and ministries but also private entities.

Section 2. Evaluation and review of progress at the Central Environmental Council

In order to enable this Plan to be implemented steadily, the Central Environmental Council will appropriately carry out evaluation and review to see the progress of the measures based on this Plan every fiscal year.

Section 3. Schedule towards the achievement of individual laws and individual measures (schedule)

We will deliberately work on the enforcement of individual laws on which to build a sound material-cycle society, according to the roadmap attached. We will also actively evaluate policies, appropriately review the contents of the measures and, wherever necessary, make a revision of the measures.

(Appendix) Schedule for enforcement of individual laws

Law/FY	Prior to FY 2012	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017
Basic Act for Establishing a Sound Material-Cycle Society	2008 Development of Second Fundamental Plan for Establishing a Sound Material-Cycle Society	Development of Third Fundamental Plan for Establishing a Sound Material-Cycle Society					Review to revise Revision of Fundamental Plan for Establishing a Sound Material-Cycle Society
Waste Management and Public Cleansing Law	2010 Amendment				Evaluation and Review		
Law for Promotion of Effective Utilization of Resources	2007 Evaluation and Review						
Containers and Packaging Recycling Law	2006 Amendment		Evaluation and Review				
Home appliance Recycling Law	2006-7 Evaluation and Review		Evaluation and Review				
Small Home Appliance Recycling Law		Passed national assembly, enacted	April 2013 Enforced				
Construction Material Recycling Law				Evaluation and Review			
Food Waste Recycling Law	2007 Amendment	Evaluation and Review					
End-of-Life Vehicle Recycling Law	2009 Evaluation and Review			Evaluation and Review			
Law on Special Measures concerning Removal of Environmental Problems Caused by Specified Industrial Wastes		Revised law passed national assembly, enforced					Extended to FY2022
PCB Special Measures Law	2001 Enforced	Review of enforcement status and development of future measures					
Law on Promoting Green Purchasing	2003 Amendment	Review of specified items that the government should promote to purchase and the criteria.					

(Note) The period for evaluation and review of the laws is cited for approximate reference.

(Appendix) Achievement of targets for individual recycling laws

Home Appliance Recycling Law

Recycling rate of specified home appliances (%) *	Items	FY2011 Actual	FY2012 Target	Law for the Recycling of Specified Kinds of Home Appliances Enforcement Order Article 3
	Air conditioner	89	70	
	TV (CRT)	79	55	
	TV (LCD, Plasma)	83	50	
	Refrigerator/Freezer	79	60	
	Washing machine/clothes dryer	87	65	
(*) Amount to be recycled (as percentage of total weight) Target has been achieved for highlighted items				

Food Recycling Law

Implementation rate of recycling of cyclical food resources (%)	Business sector	FY2010 Actual	FY2012 Target	Basic Policy on the Promotion of Recycling of Cyclical Food Resources (Basic policy of Food Recycling Law)
	Food processing	94	85	
	Food wholesale	53	70	
	Food retail	37	45	
	Food service	17	40	
(*) Target has been achieved for highlighted items				

Construction Waste Recycling Law

Target on the Recycling of Specified Construction Waste (%)			FY2008 Actual	Basic Policy (Statutory target)	(Reference) Plan 2008 for Promoting the Construction Waste Recycling		Basic Policy on the Promotion, etc. of Sorted Dismantling of Specified Construction Materials and the Recycling, etc. of Specified Construction Waste (Basic policy on the Construction Waste Recycling Law)
				FY 2010	FY2012	FY2015	
	Recycling rate	Asphalt/concrete blocks	98.4	95	98	98	
		Concrete blocks	97.3	95	98	98	
		Construction wood waste	80.3	-	77	80	
	Recycling rate	Construction wood waste	89.4	95	95	95	
		Construction sludge	85.1	-	82	85	
	Amount of waste	Mixed construction waste	2.67 million tons	-	2.05 million tons	1.75 million tons	
	Recycling rate etc.	Entire construction waste	93.7	-	94	94	
	Effective utilization rate	Soil from construction work	78.6	-	87	90	
(*) Target has been achieved for highlighted items							

End-of-life Vehicle Recycling Law

Recycling Rate of Automobile Shredder Residue (%)		FY2011 Actual	Target	Law for the Recycling of End-of-life Vehicles Enforcement Order Article 26
	Automobile shredder residue	93.3	50 (FY2010-) 70 (FY2015-)	
	Airbags, etc.	93.6	85	
<p>*1. Target has been achieved for highlighted items</p> <p>*2. Recycling rates for each automobile manufacturer are 92-94% for automobile shredder residue and 92-100% for airbags and the like, so all manufacturers have exceeded the target.</p>				

