

**Developing the Mechanisms for a 3R Society:
Focusing on Reducing Pollution,
Reusing Resources and Recycling Waste**

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In May 2000 the Japanese Diet passed a number of laws related to the environment, the most important of which was the Basic Law to Encourage the Development of a Recycling-Oriented Society. Now that the legal foundations for the creation of such a society have been laid, it is up to government (both central and local), industry and the public to assume responsibility for ensuring that such a society actually comes into being.

Such a vision requires policies for the reduction, recycling and proper disposal of waste, and assumes that resources will be used more efficiently and that negative effects on the environment will be reduced. There is an urgent need for mechanisms to ensure that such a system can actually be developed.

Such measures would be based on the priorities established in law (i.e., the need to reduce pollution, reuse resources and recycle waste) and would include steps to dispose of waste more effectively (especially by means of recycling), measures to encourage the reuse of products (e.g., quality certification and assurance), and measures to match supply with demand. Above all, such measures would have to take into account the impact on the environment at all stages of a product's life—from the design stage to when it is no longer needed. Furthermore, if Japan is to become a 3R society, such activities need to be coordinated with those of other countries.

I The Foundations of a 3R Society

1 The Year 2000 as the Beginning of a 3R Society

In May 2000 the Japanese Diet passed 10 separate laws related to the environment. The most important of these bills was the Basic Law to Encourage the Development

of a Recycling-Oriented Society. The last time so many laws on the environment were passed in Japan was in 1970, when a number of important bills were enacted to deal with environmental pollution. The year 2000 can therefore be regarded as the beginning of concrete measures to create a 3R society in Japan.

These new statutes also included a number of revisions to existing laws—for example, the Waste Disposal and Public Cleansing Law (“Waste Disposal Law”), the Law to Promote the Development of Specified Facilities for

Table 1. Laws on a Recycling-Oriented Society Enacted or Revised in May 2000

Law	Objectives	Main Points
Basic Law to Encourage the Development of a Recycling-Oriented Society	To establish the principles according to which the government will try to create a recycling-oriented society and the responsibilities of the various economic agents in order that the public will be able to enjoy a healthy and fulfilling life.	<ul style="list-style-type: none"> • Defines (1) how Japan should set about trying to create a recycling-oriented society and (2) the responsibilities of government, local authorities, businesses and the general public. • Sets out the responsibility of government for devising a Basic Plan for a Recycling-Oriented Society. • Sets priorities for the reduction, reuse and recycling of waste.
Waste Disposal and Public Cleansing Law (“Waste Disposal Law”)	To establish a system for ensuring that waste is disposed of properly and to prevent the improper disposal of waste by devising key policies, reviewing the system of waste treatment centers and industrial waste management, enforcing restrictions on waste incineration, cooperating with local public entities, and encouraging the creation of more industrial waste treatment plants.	<ul style="list-style-type: none"> • Defines the responsibility of government for devising basic policy on encouraging comprehensive and systematic action to ensure that waste is disposed of properly by reduction, recycling, etc. • Imposes stricter regulations on waste disposal. • Requires major polluters to draw up plans on how they intend to dispose of their waste. Major polluters have to submit plans on how they intend to reduce and dispose of their waste, and to keep the authorities up to date on progress.
Law to Encourage the Effective Use of Resources (partial revision of the former Law to Encourage the Use of Renewable Resources)	(1) To support action by business to recover and recycle discarded goods and (2) to cut waste and reuse parts by reducing the quantity of resources needed to produce goods and to extend their life.	<ul style="list-style-type: none"> • Encourages business to cut waste by reducing its consumption of resources and extending the life of its products. Aimed at automobiles, personal computers, major items of furniture, gas and electric appliances, and electrical and electronic goods. • Obligates business to adopt a systematic approach to reducing and recycling industrial waste by-products. Aimed at manufacturers of steel, pulp and paper, chemicals and nonferrous metals.
Law on Recycling Building Materials (“Construction Material Recycling Act”)	To ensure that resources are used effectively and waste disposed of properly by adopting measures to encourage demolition companies to sort, dismantle, and recycle particular building materials (e.g., concrete, asphalt and timber) and by requiring such companies to be registered.	<ul style="list-style-type: none"> • Obligates demolition companies to sort, dismantle, and recycle demolition waste. Regulates particular types of construction work and materials, and requires demolition companies to sort and recycle their waste. • Adopts measures to ensure that construction waste is sorted and recycled. Requires order-placers to register construction work in advance and agents to report to principals afterwards. Recommends the use of specific signage. • Regulates contractual procedures between order-placers and agents. • Establishes a registration system for demolition companies. • Sets targets for recycling. • Strengthens penalty provisions.
Law to Encourage the Recycling of Renewable Food Resources (“Food Recycling Law”)	To encourage food manufacturers and consumers to reduce the amount of food left unsold, uneaten, or discarded in the production process. To encourage food manufacturers, distributors and caterers to recycle waste food so that it can be used as feedstuff and fertilizer.	<ul style="list-style-type: none"> • Authorizes responsible government departments to devise basic policy for comprehensive and systematically encouraging those involved in the production and serving of food to recycle renewable food resources. • Encourages food businesses to recycle food resources in line with standards laid down by the responsible government department. • Encourages businesses to outsource recycling by establishing a registration system and provides advice on recycling.
Law to Encourage the Procurement of Environment-Friendly Goods (“Green Purchasing Law”)	To encourage government, independent administrative agencies and local authorities to purchase environment-friendly items, publish information, decide what is needed to stimulate demand for such items and to create a society that can sustain development with a minimum negative impact on the environment.	<ul style="list-style-type: none"> • Establishes basic policy for government and independent administrative agencies to purchase environment-friendly items, and publishes the results. • Local authorities draw up and implement an annual purchasing plan.

Source: NRI, from the text of various laws and “Waste Management,” *Kankyo Sangyo Newspaper* (June 5, 2000).

the Disposal of Industrial Waste, and the Law to Encourage the Effective Use of Resources (a revision of the former Law to Promote the Utilization of Recycled Resources)—as well as the Basic Law to Encourage the Development of a Recycling-Oriented Society, the Law on Recycling Building Materials, the Law to Encourage the Recycling of Renewable Food Resources (“Food Recycling Law”), and the Law to Encourage the Procurement of Environment-Friendly Goods (“Green Purchasing Law”) (see Table 1). In addition, the Law on the Final Disposal of Radioactive Waste was passed together with revisions to the Septic Tank Law and the Offensive Odor Control Law.

Further measures included the lifting of the temporary exclusion of waste plastic from the provisions of 1995 Law on Recycling Packaging and the decision to implement the 1998 Law on Recycling Electrical and Electronic Goods with effect from fiscal 2001. As a result of all these measures, Japan now has a full panoply of laws to enable it to create a 3R society.

2 Legal Framework for Creating a 3R Society

Until the 1980s, waste disposal in Japan was carried out in accordance with the Waste Disposal Law. However, in order to effect the transition from a socioeconomy characterized by mass production and consumption to one that stresses the reduction, reuse and recycling of waste, a wide range of regulations has been adopted since the mid-1990s.

The legal framework of these measures (especially the 1995 Law on Recycling Packaging, the 1998 Law on Recycling Electrical and Electronic Goods, and the Basic Law to Encourage the Development of a Recycling-Oriented Society) is as follows (see Figure 1).

(1) Overall framework

The Basic Law to Encourage the Development of a Recycling-Oriented Society can be subsumed under the Basic Environment Law, which forms the cornerstone of all the measures adopted in Japan to protect the environment and outlines the basic framework for ensuring the flow of materials in Japanese society.

In addition to setting basic government policy for creating an environment-friendly society, the Basic Law to Encourage the Development of a Recycling-Oriented Society clearly allocates the responsibility for achieving this objective to corporate and individual consumers (under the “polluter pays” principle) on the one hand, and to producers (under the “extended producer” principle) on the other. It also sets priorities for dealing with waste: (1) reduction, (2) reuse, (3) recycling, (4) thermal recycling, and (5) proper disposal. Furthermore, the law assigns the government the responsibility for devising a Basic Plan for a 3R Society.

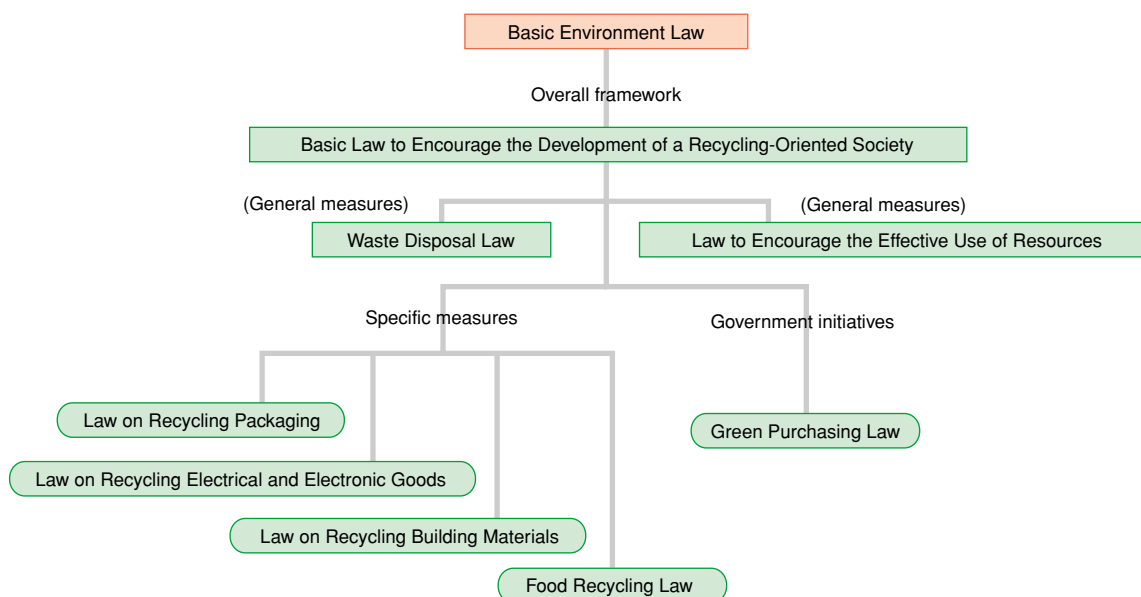
(2) General measures

Within this overall framework there are two key laws: the Waste Disposal Law, which is aimed at ensuring that waste is disposed of properly, and the Law to Encourage the Effective Use of Resources, which is designed to promote recycling.

While the Waste Disposal Law was already in place, it was revised to strengthen provisions for ensuring that waste was disposed of properly and to reinforce the responsibility of polluters as a cornerstone of a 3R society.

The Law to Encourage the Effective Use of Resources, on the other hand, established the “3R” policy—namely, the reduction of pollution, the reuse of resources and the recycling of waste. It encourages the development of products that reduce waste and reuse parts, while requiring businesses to recover and recycle used products. In

Figure 1. Legal Framework for Encouraging the Creation of an Environment-Friendly Society



the near future, it will be applied to specific products such as automobiles and personal computers.

(3) Particular measures

To reflect the specific nature of some products, a number of laws were enacted requiring producers of packaging, electrical and electronic goods, building materials and operations that lead to waste food to reduce the amount of waste they generate and to recycle resources. The main provisions of these statutes are as follows:

- **Packaging Recycling Law:** This requires producers and users of packaging to recycle packaging that has been sorted and recovered.
- **Law on Recycling Electrical and Electronic Goods:** This requires manufacturers and vendors of electrical and electronic goods to recover and recycle such goods that have been thrown away.
- **Law on Recycling Building Materials:** This requires anyone who commissions building work to sort the debris when the building is demolished and to recycle building waste.
- **Food Recycling Law:** This requires food manufacturers/vendors and restaurants to reduce the amount of waste food they generate and to recycle it.

(4) Measures to encourage the creation of a 3R society

The Green Purchasing Law aims to encourage government and other public-sector bodies to purchase goods and services that reduce the negative impact on the environment, to publish such findings, and to make all related information publicly available.

Such measures are intended to minimize harm to the environment by not only recycling, but also in more general ways such as by conserving energy. In addition, they are designed to promote a positive approach towards creating a 3R society by encouraging users to purchase goods that use recycled materials and are themselves easy to recycle.

II Defining a 3R Society

Now that these laws have been enacted, exactly what kind of 3R society is Japan aiming to create in the 21st century? The definitions offered so far by various organizations would suggest the following.

1 A 3R Economic System as Part of a Vision for a Recycling-Oriented Economy

A July 1997 joint report by the Global Environment and Waste Recycling sections of the Ministry of International Trade and Industry's Industrial Structure Council (entitled "A Vision of a Recycling-Oriented Economy") describes two key elements of such an economy:

"A society where the environment and the economy no longer compete, and where all economic activity, including production and consumption, reflects the need to conserve the environment and resources."

"A society where the adoption of market principles enables the environment and the economy to be integrated (i.e., where the market properly evaluates economic activity carried out in line with recycling-oriented principles), where the cost of conserving the environment is borne by society as a whole, and where, as a result, an effort is made to strike a balance between maintaining economic growth and ensuring that the environment is protected."

The report also describes the following two core principles that a 3R economic system should contain in order to ensure that the Japanese economy continues to grow in the 21st century:

- The use of nonrenewable resources and energy should be kept to a minimum while that of renewable resources and energy should be maximized. This will ensure that additional inputs to economic activity use as few resources and as little energy as possible (principle of minimizing inputs).
- Emissions of substances such as the following that are produced in the course of economic activity and have a negative impact on the ecosystem should be kept to a minimum: greenhouse gases such as carbon dioxide; toxic chemicals such as dioxin; heavy metals; nitrogen oxide; and substances that destroy the ozone layer (principle of minimizing emissions).

2 A 3R Economy in a Properly Functioning National Economy

A report published by Japan's Economic Planning Agency in July 1999 ("A Properly Functioning National Economy and Policies to Revitalize the Economy") deals with the issue of a 3R economy. The report, which was approved by the government, sets out policies for managing the Japanese economy in the first decade of the 21st century.

The report assumes that in the course of the 21st century a 3R economy will develop and that more will be done to deal with global environmental issues, leading to the establishment of a sustainable economic system. A 3R economy is assumed to have the following characteristics:

- The responsibility of all agents in such an economy to ensure the flow of materials and sustainable economic development will be set out clearly, and the economic system itself will ensure that less waste is generated and that resources are recycled efficiently.
- Government policy will reflect the need to reduce waste and encourage recycling; economic agents such as enterprises, consumers and the public sector will fully realize their responsibilities to reduce waste and recycle resources; and the economic system itself will incorpo-

Table 2. Features of a 3R Society

		Policy Requirements			Benefits				
		Reduction of waste	Recycling of resources	Proper waste disposal	Conservation of resources	Minimizing negative environmental impact	Lower costs	Stable supply of recycled resources	Compatibility with economic growth
Source	Prerequisites								
Recycling-oriented economic system (MITI)	<ul style="list-style-type: none"> • Proper assessment • Incorporation of costs 	○	○	○	○	○	—	—	○
Recycling-oriented society (EPA)	<ul style="list-style-type: none"> • Clear allocation of responsibilities • Incentives • Infrastructure • Incorporation of costs 	○	○	—	—	—	○	○	—
Basic Law to Encourage the Development of a Recycling-Oriented Society	—	○	○	○	○	○	—	—	—

rate incentives for them to exercise those responsibilities effectively.

- Industry will have adapted to the need to recycle resources, and the necessary technology will have been developed so that the cost of recycling will have fallen dramatically, and there will be a steady supply of high-quality, environment-friendly recycled goods.

3 A 3R Society as Defined by the Basic Law to Encourage the Development of a Recycling-Oriented Society

This law defines a 3R society as follows:

“A society which avoids producing goods that will end up as waste and endeavors to reuse goods made from renewable resources or, where such goods cannot be reused, ensures that they are disposed of properly, thereby reducing the use of natural resources and minimizing any negative impact on the environment.”

It describes “renewable resources” as “useful solid waste, etc.” and defines the terms “renewable” and “waste, etc.” as follows:

- Renewable use: the ability of being reused, (ordinary) recycling, or thermal recycling.
- Waste, etc.: waste; goods that have been used only once or recovered and disposed of without being used at all (excluding goods in current use); or goods that have been produced as a by-product of manufacturing, processing, repair, selling, the supply of energy, civil engineering work, raising livestock or other human activity.

4 Necessary Attributes of a 3R Society

According to this definition, the prerequisites, policy requirements and benefits of a 3R society should exhibit the following features (see Table 2):

Prerequisites:

The right conditions for economic agents must be created and incorporated in the economic system.

Policy requirements:

In addition to ensuring that less waste is produced and more resources recycled, there must be proper waste disposal.

Benefits:

Resources will be conserved; the negative impact on the environment will be reduced; and a balance will have been struck between maintaining economic growth and protecting the environment.

III Social Changes Needed to Bring About a 3R Society

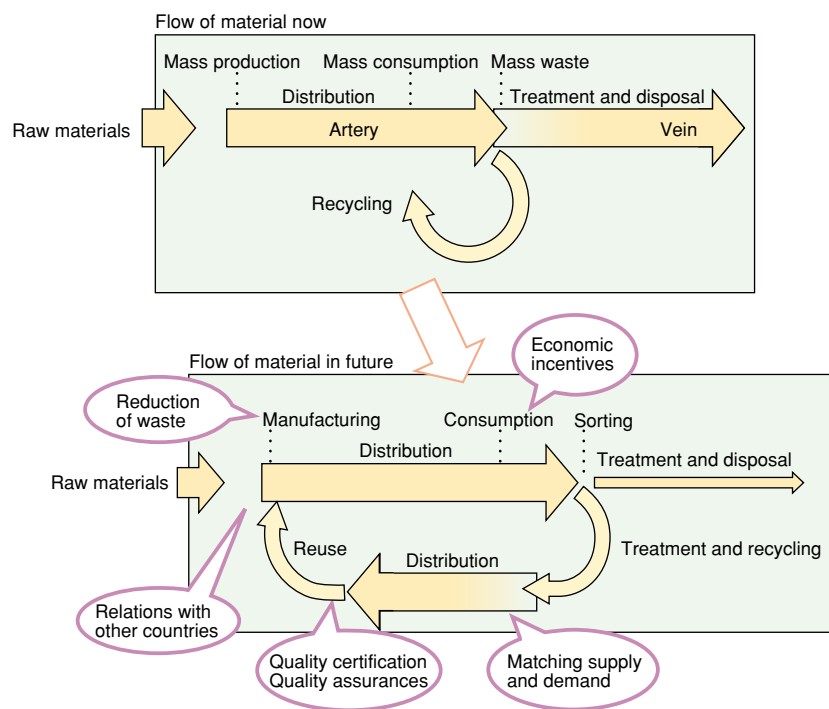
If Japan is to create a 3R society where less waste is produced, resources are recycled and conserved, and the negative impact on the environment is reduced, the traditional flow of material, wherein goods are produced, consumed and discarded en masse, will have to change. This is illustrated in Figure 2, where the top half shows how goods have traditionally been produced, consumed, discarded, treated and disposed of, and the bottom half shows how this will have to change.

In a 3R society, the following measures must be taken; the reduction of the amount of waste in production, sorting unwanted goods in discarding them; and recycling waste as well as its disposal. Although such changes are already being put into practice, they need to be strengthened as follows.

1 Recycling-Oriented Product Design

In a 3R society it will no longer be enough for goods that have been discarded to be recycled and disposed of: recycling will have to be incorporated in the way products are designed. In order to encourage manufac-

Figure 2. Flow of Material and Measures Needed in a 3R Society



turers and other businesses to do this, the law will have to be amended to make this explicit and to mandate recycling.

2 Proper Sorting of Waste

The next thing that needs to be done is to require consumers to properly sort any goods they wish to discard (on the principle that the polluter must pay) so that they can be reused or recycled. Examples of such measures include the requirement in the Law on Recycling Building Materials that building contracts specify how structures are to be demolished and the stipulation in the Food Recycling Law that businesses over a certain size observe certain detailed standards.

3 Need for Reliable Waste Recovery and Management Companies

Even if consumers sort waste properly, there is always a possibility that it may be simply dumped or otherwise discarded haphazardly. Therefore it is required to ensure that waste is recovered and recycled or properly disposed of after it is sorted.

The Law on Recycling Packaging requires local authorities to recover packaging and to select waste management companies by tender. The Law on Recycling Electrical and Electronic Goods requires that the process of disposing of such goods be recorded on control slips at all stages (i.e., from when they leave the retailer to when they reach the waste management company). Similarly, by requiring demolition and waste management companies to be registered, the Law on Recycling Build-

ing Materials and the Food Recycling Law endeavor to ensure that waste recovery and disposal are carried out properly.

4 Need for Clearer Allocation of Costs

If the flow of materials in a 3R society is to function properly, costs will have to be allocated and the necessary infrastructure put in place.

The above recycling laws allocate costs clearly. Under the Law on Recycling Electrical and Electronic Goods it is the polluter that pays; under the Law on Recycling Packaging it is the local authorities and the businesses involved; and under the Law on Recycling Building Materials it is the principals who place orders. In the case of equipment such as air conditioners, TV sets, washing machines and refrigerators, manufacturers in Japan already publish figures showing how much of the cost of recycling such products is borne by the consumer, while the Food Recycling Law has adopted a special provision of the Waste Disposal Law on how waste food is transported in order to encourage waste management companies to set up the necessary infrastructure.

IV Issues in Creating a 3R Society

Although the various recycling laws are gradually creating the conditions for a 3R society, we need more systems to promote actual changes—including addressing some of the following important issues.

1 Encouraging Market Competition

The legal framework specifies the agents, infrastructure and costs involved in the flow of material and also ensures that the necessary arrangements are made for the recycling process to function properly.

Strictly speaking, however, the 3R socioeconomic system that will be created is intended to ensure that goods that are no longer needed are properly sorted, recovered and disposed of. It doesn't guarantee that manufacturers will use recycled resources and that consumers will buy goods made from them.

Now that a legal framework for recycling (which was not fully functioning under the former market principles) has been improved, the first major issue that now needs to be addressed is how to create a market that matches the demand for and the supply of renewable resources, and ensures that they can compete on healthy terms with virgin resources.

2 Changing Consumer Behavior

Although the Basic Law to Encourage the Development of a Recycling-Oriented Society establishes priorities—namely, (1) reducing waste, (2) reusing resources and (3) recycling them—it does not ensure that they will be followed. In particular, (1) and (2) depend very much on consumer behavior, but they can have a major effect on conserving resources.

All this indicates that creating a 3R society will require not only effective measures for recovering and recycling waste, but also a change in the attitudes of producers and consumers to virgin resources and to goods made from them. The second major issue that needs to be addressed is how to ensure that a 3R social system provides information about such matters and incentives to change people's behavior.

3 Mechanisms for Dealing with These Issues

As indicated in Figure 2, in order to create a market where renewable resources can compete on healthy terms with virgin resources, ways have to be found of (1) using the Internet and other information technologies to effectively match demand and supply in terms of reusable and recycled resources and (2) of obtaining quality certification from third parties and quality assurances from manufacturers. This would ensure that goods and information reach the people who need them.

Changing consumer behavior also requires economic incentives (e.g., environmental taxes) for manufacturers to use fewer resources ("ecodesign") and for consumers to become more interested in services than goods (i.e., use rather than possession).

V Resolving the Paradoxes Inherent in Trying to Create a 3R Society

There is a paradox inherent in moving from a social system where production, consumption and waste disposal are done en masse to one in which the 3R principles are given more than lip service. The paradox is that the amount of the material flowing within the system can never be the same but rather is either increasing or decreasing.

Even if we assume that Japan as a socioeconomy is a closed system, not all of the material in a 3R society is renewable even if most of it can be either reused or recycled; some of it will be disposed of and disappear from the system. This means that unless the material in the system is replenished from overseas, it will decrease.

The antithesis is that, while this enables material to continue to flow within the system, the material itself accumulates with the input from the outside. This is why the quantity of material in the system increases.

Japan currently imports a wide variety of resources. It could therefore one day find itself in the highly paradoxical position that, by trying to create a 3R society, the quantity of material within the system could actually increase.

A good example of this is imported agricultural produce. If such foodstuffs are imported and consumed, the nutrients used in producing them accumulate and gradually increase in quantity.

Therefore, although Japan as a whole urgently needs to create a 3R society, it also needs to revise its laws to take account of international implications and to cooperate more with other countries in order, for example, to be able to export the renewable resources it produces (e.g., feedstuff and fertilizers) to the countries from which it imports agricultural produce.

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