

Towards Implementing the “Green Product-Chain”

**Draft Interim Report of the Green Manufacturing Working Group,
Waste Management and Recycling Subcommittee,
Industrial Structure Council / METI**

(provisional translation)

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1. Working toward a society capable of implementing the “Green Product-Chain”

Issues to be discussed

- What basic principles are needed to minimize natural resource consumption, waste generation and environmental impact, in the course of working toward a sustainable society?
- How should we reinforce the efforts towards a 3R (Reduce, Reuse, and Recycle) -based sustainable society considering the entire life-cycle of products? What are the prerequisite conditions for fostering Green Manufacturing, a Green Market, and Green Consumers which minimize environmental impact?

(1) *Status quo and trends of relevant parties*

In Japan, in order to promote the development of a sustainable society, 3R-based Sustainable Society legislation has been established. Since 1990, recycling laws and relevant guidelines have been promulgated for every category of industry and product. In product-related legislation, one of the achievements is the system of recycling home electrical appliances; today, more than 10 million home electrical appliances are collected and recycled annually. Through remarkable recycling activity such as using plastic from discarded home electrical appliances in the production of the same category of products, our society has improved the efficiency of resource utilization.

Due to the appearance of the new “loop” of the product-chain of the product life cycle,, which was impossible in the conventional supply-chain, some manufacturers are

attempting to collect information from recycling factories, and to use this information in designing new products. However, further cooperation among relevant stakeholders such as consumers, governments and businesses is required to enable this system to work fully in society.

Meanwhile, a global viewpoint is essential when establishing a legal framework for waste management and recycling, because the scope of legislation in each country has been expanded to include not only the “downstream” (collecting and recycling) stage but also the “upstream” (designing and manufacturing) stage, and the manufacturing process and the product market have become highly globalized.

(2) *Principles and basic stance on the issue*

Change to a life-cycle-oriented society

To minimize natural resource consumption, waste generation, and the environmental impact in the life cycle of products, we should aim for realization of the “cradle-to-cradle” system (life-cycle-oriented society), which enables the full use of recycled materials and reusable parts, rather than the “cradle-to-grave” society, which considers only the environmental impact of disposal.

From quantity to quality – utilizing product environmental information in creating new value

In creating a life-cycle-oriented society, the quality of recycling, such as the quality of recycled products and the degree of environmental impact, is even more important than the quantity of recycled products.

In this regard, the utilization of various types of product environmental information is considered essential. Providing explicit information on the environmental impact of products at the supply-chain stage (procurement, production, distribution, collection and reuse/recycling) for relevant parties could contribute to realizing a life-cycle-oriented society.

We should create a society where product environmental information is regarded as a new factor for evaluation in addition to the function or price of products. In other

words, the efforts of the manufacturer regarding the environmental aspects of products are evaluated to create new value in the market, so that private businesses will be motivated to introduce technological innovations.

Meanwhile, environmental education is essential for consumers and customers to be able to evaluate environment-friendly products, and stakeholders—including industries, consumers and customers—should cooperate in creating this kind of life-cycle-oriented society,

Establishing a “Green Product-Chain”

To accelerate development of a 3R-based sustainable society, it is important to promote “Green Manufacturing,” as well as to let “Green Consumers” and a “Green Market” evaluate the efforts of “Green Manufacturing by producers.” In other words, we should incorporate environmental aspects into the economic system, in order to realize a “Green Product-Chain.”

To promote these activities, relevant parties—including private businesses (there are various related activities in the supply chain, such as procurement, manufacturing, distribution, and collection and recycling of products), consumers and customers, NPOs, local governments, and the central government—should cooperate in creating a sustainable society, while respecting each other’s positions.

Views on consistency of international system

Since waste management and recycling issues are no longer solely a domestic concern, cooperation with neighboring countries and the impact on international trade should be considered. In this regard, Japan should be a pioneer in the development of the life-cycle-oriented system of products, and in coordination with other interested countries, we should share the concept of such a society with people all over the world and encourage other countries to take the same approach to creating such a society.

2. Moving toward a highly developed green manufacturing system

Issues to be discussed

- In order to realize a 3R system focusing on the life cycle of products in our society, what kinds of measures for which categories of products are necessary to mitigate the environmental impact of products?

- What kind of product environmental information should be shared and utilized in order to complete the life-cycle chain from the stage of design and manufacturing to the stage of collection and reuse/recycling?

(1) *Status quo and trends of relevant parties*

Due to the establishment of collection and recycling systems for home electric appliances and personal computers (PCs), the recycling of materials from these products—such as steel, aluminum, glass and plastic, as well as reusable parts—has been enhanced. In light of information received from recycling factories, we are likely to upgrade resource utilization and enhance the controllability of recycled materials and the efficiency of the recycling process by displaying information on the materials and substances contained in the products, and listing the parts to be disassembled.

Meanwhile, efforts at the “upper” (design and manufacturing) stages, such as R&D of environment-friendly products in each company, and establishing guidelines concerning DfE in business associations are progressing, and the rule requiring indication of types of plastic has been in force since 1991. However, since current eco-design rules (e.g., provisions for designated resource utilization products in the Law for the Effective Utilization of Resources) are rather subjective, specific DfE measures and notification methods by manufacturers are not uniform. In addition, product environmental information at the design and manufacturing stages is not always conveyed to the collection and reuse/recycling stages, and therefore the information is not utilized fully at the downstream stage (e.g., regarding the selection of materials to be utilized).

In designing and manufacturing products, it is necessary to take a comprehensive approach in considering relevant factors such as safety, quality, and the environment. In terms of the environment, manufacturers are required to consider the factors of energy consumption, appropriate waste treatment, and resource utilization; they are

currently confronting the challenge of how to balance these factors.

Also, while manufacturers have begun to disclose product environmental information, there is the possibility that consumers will find it difficult to compare the eco-friendliness of products when purchasing them, because the rules on disclosure of environmental information are not uniform.

(2) Principles and basic stance on the issue

Design for Environment (DfE) with life-cycle-oriented system

From the viewpoint of minimizing natural resource consumption, waste generation, and environmental impact, it is important to implement necessary measures at the earliest stage of the product-chain. In terms of the product life-cycle, adopting DfE at the design and manufacturing stage is the most important. In addition to the importance of DfE, legislation for reuse and recycling, and the social aspect of a product's life-cycle, also need to be taken into account when making decisions on specific measures.

Product categories to be addressed

Generally, in establishing recycling laws to provide a legal framework for the 3Rs, the following points have been regarded as important in respect of resource utilization and appropriate waste treatment for manufacturers.

- amount of waste to be disposed after use
- value of materials contained in the products
- expected results of legislation (e.g., resource utilization and environmental protection)

We should retain the above points in this report, but considering the feasibility of manufacturers implementing the requirements, as well as discussion by international bodies, home electric appliances and PCs should be the primary categories of products targeted now, because we have achieved notable results in the collection and recycling of those products. Expansion of the category of products to be subjected to recycling laws, should be discussed as part of long-term goals.

Uniformity of DfE rules

In light of our efforts so far, it is necessary to implement more specific and uniform DfE measures in order to maximize the benefit of DfE in society, as DfE measures currently depend on efforts by individual manufacturers.

There are various goals of DfE, such as to minimize environmental impact at the stage of use by consumers (e.g., energy saving performance and safety) and at the stage of manufacturing and recycling (e.g., 3R-oriented design, proper management of waste). Now that legislation has been established for notification rules of energy-saving performance on the basis of consumer awareness, we should mainly discuss measures at the stages of manufacturing and post-use.

Specifically, we should address the following two points:

1. Measures to promote 3R-based design and manufacturing
2. Measures to handle specific substances contained in products

As for the index or concept for evaluating integrated various environmental performances of a product, as long as the index or concept can express the explicit environmental performance of a product, they can influence the purchasing behavior of consumers, and therefore we should continue discussion on this as a long-term goal. In order to achieve this goal, we will start our discussion on appropriate processes and measures to evaluate and integrate various data related to product environmental performance.

Meanwhile, considering that there is no globally accepted index or concept to integrate the various environmental performances of a product, at this time we should focus on disclosure of product environmental information in relation to specific measures, while being careful to avoid “recycling for the sake of recycling.” This concept of disclosure of environmental information is considered to apply to various forthcoming approaches which are developing so fast that it is difficult to anticipate future developments at this point in time.

In order for all parties to utilize product environmental information in relation to specific measures, we should establish specific measures including disclosure rules and

information exchange rules for all parties concerning the life-cycle of products.

2.1 Specific provisions for environmentally friendly design

Issues to be discussed

- What measures should we give define and standardize, in order to promote design and manufacturing for 3Rs, and the handling of substances contained in products?

(1) Status quo and trends of relevant parties

Home electric appliances in Japan are designated as specified reuse-promotion products under the Law for Promotion of Effective Utilization of Resources. Specifically, individual manufacturers are implementing various voluntarily measures, including announcements on the use of recycled materials and used parts; promotion of using recyclable materials; reduction of the number of parts in order to facilitate reassembling, separating, and recycling of materials; labeling to facilitate reassembling; and labeling to secure safety in disposal and recycling. However, due to the lack of standardization of the definition of the utilization factor of recycled material, for example, the efforts of manufacturers are not appropriately compared or evaluated, and therefore, their efforts are only minimally acknowledged by society. And due to the lack of standardization of labeling specifications for identification of disassembly points (e.g., the points of screws), information utilization is difficult for recyclers which handle the end-of-life products of various manufacturers, and for importers when reusing and recycling them.

In general, in order to enable specific functions and performance, various substances are used in products, including electrical appliances. Regarding products for which a recycling scheme has already been established, some materials (such as metals, plastics and glass) have been separated and recycled into the same materials. For hazardous substances, the Law concerning the Examination and Regulation of Manufacture of Chemical Substances regulates both the production and use of substances; in terms of the appropriate disposal of wastes, the Waste Management and Public Cleansing Law regulates the emission or release of substances into the environment at the disposal stage.

In this regard, in the EU, the EU Directive on Restriction of Hazardous Substances (RoHS) was established, which requires manufacturers of specific categories of

electrical appliances to ensure that designated substances are not contained in their products. Because the RoHS will take effect in the EU in July 2006, manufacturers and distributors with products on the EU market will have to control the information on the substances contained in their products (e.g., rate of content of designated substances) more strictly. However, the following aspects of the RoHS have been criticized: the RoHS regulates only a subset of the entire category of products which use designated substances; RoHS criteria are incomprehensible; there should be a basic concept underlying RoHS, such as life-cycle environmental assessment of products and scientific risk-assessment of designated substances, but this is not clear. As for alternatives to the restricted substances, it is not clear whether safety assessments of the alternative substances have been conducted, whether deterioration of safety in using alternative substances is examined and evaluated, or whether the risk of depletion of alternative substances has been assessed.

Some of the manufacturers which produce and distribute products in the global market are now promoting “green procurement,” that is, procurement requiring parts and material suppliers to provide information on substances contained in the parts or materials in view of enhancing the environmental friendliness of their products, as well as adopting environmental regulations for products in overseas countries. In this regard, standardization of environmental information which is conveyed over the whole supply chain of products is more important than ever before.

(2) Principles and basic stance on the issue

Promoting design and manufacturing for 3Rs

In view of reducing natural resource consumption and waste generation, in addition to improvement of the durability of products (including reuse of the product itself), the utilization of reusable parts and recycled materials must be enhanced. However, there is no standardized and comparable index which consumers can refer to in checking how many recycled materials are used in the new products.

However, with the development of the recycling scheme for electric home appliances and other appliances, materials from discarded products have been separated and collected. Moreover, recyclable materials such as plastics are actually utilized again in the life-cycle chain of the products. Therefore, to evaluate the environmental performance

of products appropriately in respect of utilizing recycled materials, we should define the utilization factor of recycled materials, and make the factor acknowledged as a new axis in the evaluation of products.

For example, for used plastics, it goes without saying that plastics separated by type and feature of materials have more value in material recycling than plastics which are not separated. Meanwhile, recyclers are confronting difficulties in upgrading the quality of recycled materials by shredding and mechanical separation. Therefore, to upgrade the use of recycled materials after products are disposed of, it is essential to let recyclers use the information on the types and features of the materials and the information for reassembling. In this regard, we should standardize labeling of the quality of recycled plastics, as well as labeling to notify users of the points at which to remove screws or other parts.

Measures for substances contained in products

For above reason, we should not necessarily take the same approach as the EU directive, which restricts the use of specific substance such as lead in products. However, considering the preciousness of the substances as finite natural resources, and the importance of appropriate disposal, we are likely to seek means to prevent emission of the substances into the environment, to enhance the efficiency of the reuse and recycling process, and to improve the quality of recycled materials by separating and controlling the substances appropriately at the stage of reuse and recycling.

In this regard, in Japan, where recycling systems are so advanced that more than 10 million sets of end-of-life home electrical appliances are collected and recycled annually, we should seek to establish a system in which substances that are scarce, useful and/or hazardous and are contained in products are controlled in the supply chain, and that information on the substances is disclosed and monitored appropriately.

By establishing this system, information is utilized at the collection and reuse/recycling stage, and we can upgrade the level of reuse and recycling. Also, we can expect mitigation of the environmental impact by reducing the amount of waste, promotion of resource utilization by improving the use of resources, and improvement of efficiency of reuse and recycling activities. In addition, by enhancing this system, we can appropriately evaluate the efforts of manufacturers for promoting the design and

manufacture of environment-friendly products. And, we can build a system that is consistent with international systems.

As for the identification of substances subject to disclosure when the product is placed on the market, while we have to consider the capabilities of manufacturers of materials, parts, and products, and reuse/recycling companies in the supply chain, as well as consistency with international systems, from the discussion so far, we have to consider the following points regarding the designation of such substances.

- substances which could degrade the quality of recycled materials or hinder the recycling process when they are mixed with other recyclable materials
- substances which could affect the environment if they were treated inappropriately after use
- substances which are so scarce that collection and recycling schemes are urgently required

As for the measures related to disclosure of the substances, while we have to take into account the protection of intellectual property rights, as well as the progress of the international standardization discussion, the following points should be considered. Further discussion should take place in cases where it is not clear whether the substance is contained in a product or not.

- labeling on the body or packaging of products, to note the inclusion of designated substances
- announcement of parts where designated substances are included, announcement of amounts of included designated substances, and display of designated substance marks of inclusion in the catalogues, instruction manuals, and websites of products.

2.2 Direction of utilization of environmental information on products

Issues to be discussed

- How should we convey environmental information of products at the design and manufacturing stages to consumers and customers, and what measures should we take to encourage relevant parties to make such efforts?
- What kind of environmental information should we standardize among relevant parties in the supply chain of products?

(1) Status quo and trends of relevant parties

For consumers and customers, in addition to price and function of the products, their environmental performance is also becoming an important point of evaluation when purchasing products. In this regard, one approach of consumer organizations is the “Ten Principles of Eco-labeling for Consumers” by the Nippon Association of Consumer Specialists (NACS), which bridges the position between consumers and corporations. One approach of NPOs is an activity by the “Green Procurement Network (GPN),” which provides environmental information on products. As an example of the approaches of business associations, Japan Electrical Manufacturers’ Association offers information on the environmental performance of home electrical appliances. In addition, manufacturers are required to positively provide environmental information on products to consumers by several laws including the Fundamental Law for Establishing a Sound Material-Cycle Society, the Law on Promoting Green Purchasing, the Law for Promotion of Environment-friendly Activity, and the Consumer Protection Fundamental Act.

However, it is reported that only approximately 5% of consumers actually buy environment-friendly products even though approximately 80% of consumers are interested in environmental issues. It is also reported that consumers do not usually have enough information on the environmental impact of products. In order to have the environmental information of products be utilized appropriately in the market, it is necessary to continue discussions on how to convey environmental information more explicitly.

In order to enhance the efforts of manufacturers to make their products more environment-friendly, it is necessary for manufacturers to obtain sufficient information when they purchase materials and parts from suppliers. However, it is reported that there is some confusion among suppliers because the information that manufacturers require differs from manufacturer to manufacturer, and some manufacturers do not explain the reasons for and background of the requirement to their suppliers.

(2) Principle and basic position to address the issue

The role of consumers and customers in the “Green Product-Chain”

In order to shift Japan to a life cycle-oriented society, it is important to realize a system which is able to minimize natural resource consumption, waste generation, and environmental impact. To achieve this goal, the role of the consumers and customers who purchase products is important. In this regard, when considering the social acceptability of measures, we should discuss measures not only for manufacturers but also for consumers and customers.

In the “Green Product-Chain”, consumers and customers are encouraged to: (1) purchase environmentally-friendly products, (2) commit themselves to respecting the 3Rs when purchasing new products, and (3) dispose of the end-of-life products in an appropriate way. Their active participation is required.

To foster the development of such consumers and customers, it is important to create a scheme which will benefit manufacturers, consumers, and customers, as well as reduce the environmental impact of products. Therefore, we need a scheme which creates incentives for manufacturers, consumers, and customers to purchase environmentally-friendly products, and to commit to the 3Rs.

Ways of providing environmental information on products to consumers and customers

Disclosure of environmental information is important, and we have to think about how to provide this information and the kind of contents that should be included. We should think separately about information for consumers to promote their purchase of environmentally friendly products and information for manufacturers. Especially, in discussions regarding the modalities for consumers and customers, we should pursue

the modalities not only to disclose accurate information but also to disseminate information among consumers and customers. Manufacturers of products are required to offer comprehensible environmental information to consumers and customers.

With regard to information for consumers and customers within the “Green Product-Chain”, we should further discuss ways to provide information that can help consumers choose environmentally friendly products. At the same time, in addition to the 3Rs, we should implement measures to integrate other environmentally friendly information (including energy-saving performance), on a gradual basis.

In order to diversify the information path, we should enhance information provision through the websites or catalogues of products, besides environmental labeling. In addition, since information provision at the stages of retail and distribution is effective, we should enhance environmental communication at the distribution stage, and also seek a system to provide enough information for consumers’ reference when they purchase products. In addition, we should also seek to provide information through the mass media and third-party product testing centers. It is also important to promote environmental communication within the “Green Product-Chain”, so that manufacturers can get feedback from customers through the evaluation of their products.

In order to create a scheme in which the environmental performance of products is graded appropriately in the market, we should enhance demand-pull measures such as green purchasing in cooperation with the Ministry of the Environment (MOE) and other relevant ministries and NPOs.

Information provision among parties in the supply chain

To pursue environmental friendliness throughout the entire supply chain, including parts and materials suppliers as well as process manufacturers, it is necessary to distribute explicit environmental information over the entire supply chain, and to improve the efficiency and credibility of information.

In general, the transactions within this supply chain are B-to-B businesses, and the degree of environmental friendliness of the intermediate products ultimately appear as that of the end products. Therefore, it is better that we do not establish legal regulations

on the entire supply chain. However, regarding the substances whose inclusion in a product is required to be disclosed, we should clarify the necessary matters. And regarding the technical modalities by which to disclose the substances contained in products, we should standardize them, considering the protection of intellectual property rights and consistency with international discussions and the possibility of utilizing industrial standards.

In addition, to enhance the efforts for Design for the Environment nationwide, we should establish infrastructure such as Information Service Centers for information services regarding the background and necessary matters for DfE, not only for large manufacturers and importers but also for small and medium-sized enterprises in the entire supply chain.

3. Ensuring consistency with international systems

Issues to be discussed

- Movements to require environmental awareness in designing and manufacturing products are accelerating not only in Japan but also in some other countries. In addition, discussion towards establishing international standards has just begun.
- In response to the above trends, how should we address the discussion on international standardization of the environmental aspects of products?

(1) Status quo and trends of relevant parties

Movements to require environmental awareness in designing and manufacturing products are accelerating not only in Japan but also in some other countries, and relevant legislation has been established or is under discussion in the EU and P.R. China. Also, discussion towards establishing international standards has started, and at the International Electrotechnical Commission (IEC), discussion toward standardization in the three areas of EcoDesign, material declaration and measurement of chemical substances will be held from this spring. In this regard, we should address the discussion on international standardization.

Regarding the IEC, a new Technical Committee to discuss EcoDesign (TC111) has been established, and a representative of Japanese industry took the chair and started the discussion.

(2) Principles and basic stance on the issue

Utilization of Japan Industrial Standards (JIS) and securing consistency of international systems

Traditionally, specific requirements including technical matters in legislation have been provided by ministerial ordinances and announcements. However, in order to keep pace with change in the discussion on environmental policies and environment-related technological development, but for several exceptions such as compulsory matters (e.g,

obligation to label), which are still suitable to be provided in ministerial ordinances, most technological matters such as the modalities of labeling should be defined in industrial standards such as JIS as much as possible, and the standards cited in the legislation.

In addition, when establishing such industrial standards, it is very important to ensure consistency with international standards through linking up with discussions at IEC. In order to make use of our experiences in Japan so far, industries and governments should cooperate with each other, and contribute positively to the international standardization discussion at the IEC.

In order to promote the “Green Product-Chain” on a global basis, Japan should contribute to its expansion. To disseminate basic 3R concepts (e.g., green manufacturing) from this working group, Japan should work to promote better understanding and cooperation with other countries through various occasions, including the Ministerial Conference on the 3R Initiative and its side events (International Symposium on the 3R Initiative), and work to increase understanding by other countries. In particular, for Asian countries, where Japan has a close relationship in terms of exporting and importing products, we should cooperate closely with those countries and improve our mutual understanding through bilateral policy dialogue.