

The Recycling Issue and the Efforts of Industry

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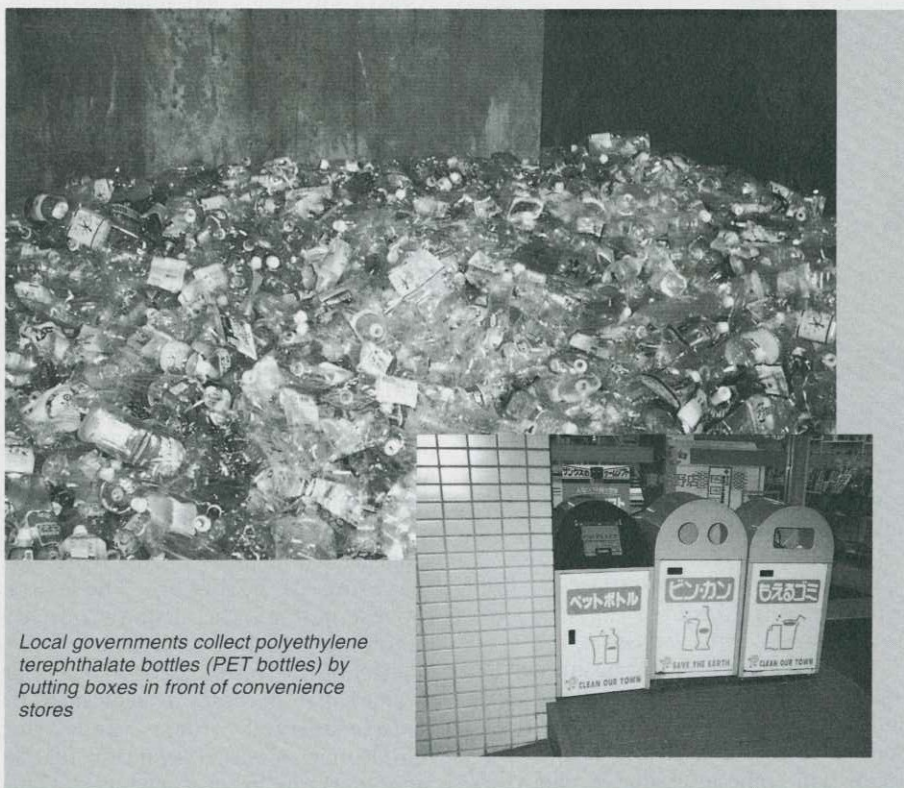
Recycling policies are adopted by nations all over the world. Each policy is unique, tailored to the specific needs of the nation. In this article, the Japanese legal framework regarding recycling, and the responses of the industry to this system are outlined.

Recycling-related issues cannot be studied without first understanding the domestic system of waste disposal. The legal framework of waste disposal in Japan, and recycling efforts implemented by private enterprises within this system will be outlined. Then, an overview of recycling measures actually adopted in Japan will be given, also reviewing responses from the industrial sector. Responses vary among various industries, ranging from the straightforward adoption of systems defined by regulations to self-imposed control by respective industries, as is often the case with foreign countries.

It should be noted that, while the moralistic nature of environmental issues elicit such attendance from the industrial sector, the responses in turn are giving rise to new, environment-conscious industries.

Waste Disposal and Recycling

The Japanese Waste Management and Public Cleansing Law sets forth different requirements for waste disposal depending on the types of waste. Individual companies are responsible for the disposal of industrial waste generated in the course of business activities. Domestic waste from households, however, is tended for under the responsibility of municipalities. Private enterprises and municipalities may commission the disposal of waste to certified waste treatment companies. Such treatment companies are evaluated for their technical and economic waste disposal



Local governments collect polyethylene terephthalate bottles (PET bottles) by putting boxes in front of convenience stores

capabilities by public institutions prior to certification. The legislative framework is supplemented by recycling efforts implemented among the private sector.

Private enterprises are required to dispose of industrial waste individually, or to subcontract the disposal at their own expense, and thus are motivated to actively recycle their waste, especially when it is economically feasible to do so. For instance, plants in the petrochemical industry are known for their optimization of the recycling capabilities. The recycling rate for industrial waste is higher than those of domestic waste, with approximately 40% of the entire industrial waste currently being recycled. In addition

to the evident ease of collection and the transparency of chemical composition and other relevant characteristics to those responsible for the disposal of waste, encouragement from the legislative framework may also be contributing to this result. Industrial waste is sometimes found to be of use within other firms and/or industries, and are recycled beyond corporate boundaries. The cement industry, for instance, accepts industrial waste from a wide array of industries, using sludge and metal slag as raw material and plastic waste as fuel. Plastic may also be used as a reducing agent in blast furnaces to produce iron and steel, and steel industries in Germany and other countries are already setting the

example for this type of application.

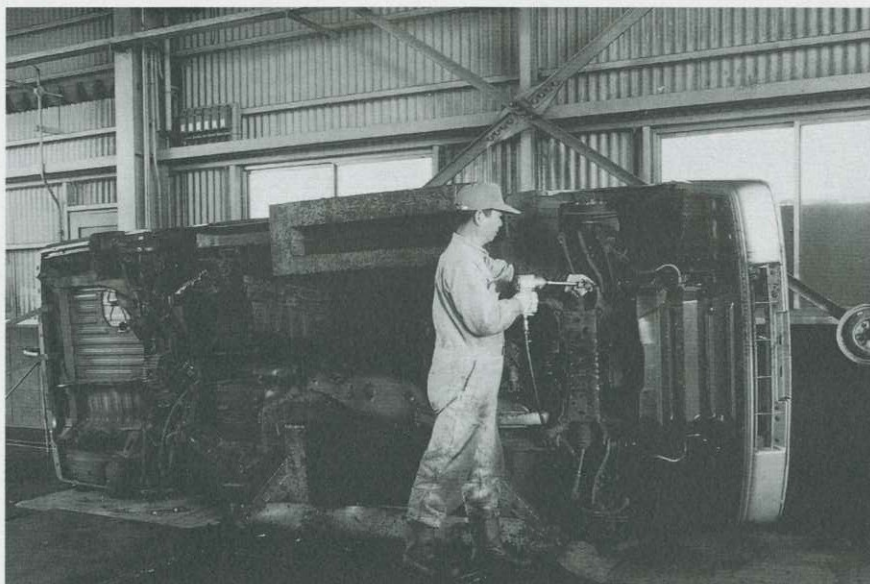
As potential sources of health hazards such as dioxin, the treatment of industrial waste warrants caution from the perspective of public safety. There are also implications, however, that regulations on industrial waste disposal are too strict, hindering the progress of technically and economically viable recycling applications. The administration of permits for industrial waste disposal by prefectural governments prevents the efficient transfer of industrial waste beyond prefectural boundaries, and is regarded as a major constraint obstructing the promotion of recycling. Such institutional limitations also constrain the proactive actions on behalf of the industrial sector.

Recycling systems have been established for recyclable domestic waste which may be reused as resources. Empty beverage cans and waste paper, for instance, are processed as material for new cans and recycled paper, leading to the voluntary establishment of recycling systems. However, spontaneous action alone is insufficient in the case of domestic waste. Unlike industrial waste with uniform properties, domestic waste is an assortment of diverse materials in terms of chemical content, and channels to effectively deliver such waste to those capable of recycling such material are difficult to establish. Because of the inherent difficulties, the recycling rate for domestic waste has leveled off at about 10%.

A series of recycling-related legislative systems are being implemented to overcome such problems, with affirmative responses from the industries concerned:

Recycling Law and Specially Designated Industries / Specified Products

The Law for the Promotion of Utilization of Recycled Resources (Recycling Law) was promulgated for the promotion of recycling efforts by resolving bottlenecks in waste disposal. The Waste Management and



Under MITI's "End-of-Life Vehicle Recycling Initiative," high-quality used parts and materials are recycled

Photo: West Japan Auto Recycling Co., Ltd.

Public Cleansing Law mentioned above is focused on the subject of waste disposal. A new set of regulations became necessary for the promotion of using recycled material and recycling-oriented considerations in the designing stage, and the Recycling Law was adopted in 1991 to address these needs.

The provisions of the Recycling Law are centered around the obligations of specially designated industries to utilize recycled materials. Businesses in the specially designated industries of glass, paper, and construction materials are obliged to include a specified ratio of recycled materials in the products they manufacture. Although penalties for non-compliance are not defined, applicable businesses are attempting to comply with the standards set forth in the Law. It should be noted that the regulation was designed to indicate a standard for the use of recycled materials by domestic manufacturers, and was not meant as an obligation forcing importers to use domestic products.

In addition to specially designated industries, Recycling Law-related efforts are actively being implemented for the disposal and recycling of "first

class specified products." This category applies to products including televisions, air conditioners and personal computers incorporating nickel/cadmium batteries, recommending businesses engaged in the manufacture, distribution and sale of these products to comply with specific standards laid out for respective types of products. The standards provide for recycling-oriented considerations to be built into the product design as well as the appropriate treatment of materials. In the case of air conditioners, the standard calls for arrangements concerning toxic substances (CFCs). Manufacturers incorporating nickel-cadmium batteries in their products are called upon to adopt product designs facilitating the ease of removal of such components. This is also an example of the consideration to be introduced at the product design phase for the treatment of toxic substances. Although the provisions are not compulsory engineering standards, businesses are responding positively as in the example of electric appliance manufacturers replacing difficult-to-recycle plastic frames with easily recycled light-metal frames. Automobile manufacturers are also moving to



Chlorofluorocarbon, a greenhouse gas, is thoroughly removed from consumer electrical appliances and the used parts and materials are recycled

comply by easing the polyolefin grade requirement of their components, using the same material for all peripherals and by reducing their use of lead. Despite the fact that the provisions of the Recycling Law are not compulsory, these examples indicate the effectiveness of the designation of first class specified products.

It should be noted that the provisions set forth for first class specified products are not defined as technical "prerequisites," but are rather standards "to be taken into consideration" at the production level for the ease of recycling.

Law for the Promotion of Sorted Collection and Recycling of Containers and Packaging and the Responses of Industry

In terms of volume, containers and packaging materials make up about 60% of all domestic waste, making them a particularly pressing target for the adoption of recycling measures. This is one of the common areas of legislative actions among nations, and Japan is no exception in the designation of responsibilities of

municipalities, businesses and individuals. Within the Japanese recycling system, residents are required to separate containers and packaging materials from other garbage, and the municipalities responsible for the disposal of domestic waste must manage the sorted materials separately from other waste. Finally, the manufacturers (e.g. PET - polyethylene terephthalate - bottle suppliers) and containers and packaging material users (e.g. content suppliers such as Coca Cola) recycle the recovered material into new products. The process of recommercializing or recycling these materials into new products is generally subcontracted to private businesses under the close supervision of a specified government association (i.e. the Japan Container and Packages Recycling Association).

The law requires container and packaging material users and manufacturers to recycle containers and packaging material into new products. Unlike those of the Recycling Law, the requirements of this Law are compulsory, and the costs involved in the compliance of this Law are reflected on the production and distribution of

the containers and packaging. Such provisions were devised to serve as incentives to use containers and packages requiring lower costs in recycling by encouraging content suppliers to select containers and packaging materials with an awareness of the cost of recycling. The obligations differ depending on the types and characteristics of the containers and packaging. Cans, glass bottles, and paper cartons such as milk cartons with adequately established recycling systems are excluded from the obligations for recommercialization.

Under these circumstances, firms are beginning to engage in the recommercialization of containers and packaging. Such businesses include companies recommercializing PET bottles and firms involved in the transporting of materials needed for product recycling; both are eligible for the supportive measures provided under the Eco-town Plan*. It is predicted that such activities will gain additional recognition when the Law for the Promotion of Sorted Collection and Recycling of Containers and Packaging goes into full effect in April 2000.

Law for Recycling of Specified Kinds of Home Appliances and Responses of Industry

Japan leads the world in promulgating laws for the establishment of recycling systems for four major household electric appliances — televisions, refrigerators, air conditioners and washing machines. The Law for Recycling of Specified Kinds of Home Appliances requires consumer electronics retailers to take back the four household appliances upon request from their customers for a certain fee, and return the products to their manufacturers. At the expense of their customers, manufacturers then recycle them into new products. The legislative measure adopts the approach established by consumer electronics manufacturers within the existing compulsory collection system for the four types of products.

The main characteristic of this

system is that consumers are charged with the cost of recycling. Unlike the Container and Package Recycling Law providing for the recovery of the cost of recycling at the point of sales, the provisions of this law allow for the recycling cost to be recovered in the event the used products are returned to the retail establishment. This system was adopted for two reasons. First, the system must also cover electric appliances already present in homes. Since the recycling costs were not collected for the products sold prior to the establishment of the system, the costs must be recovered when the used products are returned instead of adding them to the sales price of products newly sold. The second is based on the assumption that recycling should eventually become less costly, and it would thus be unfair to charge for the recycling of products at the time of sales.

The recommercialization requirements under this Law go beyond the recycling of products, providing manufacturers with the additional flexibility of reusing parts on an as-is basis. The reuse option for parts will call for the adoption of new approaches by manufacturers, including the revisioning of parts at the design phase. Although this will involve additional expenses, promoting the reuse of parts should facilitate the reduction of waste. In addition, the prolonged usage of parts may lead to new maintenance/repair services and technical development, and even the creation of new businesses.

Recycling Initiatives for Automobiles

Japanese automobile manufacturers are under pressure to respond to environmental concerns through such measures as the improvement of fuel consumption and controlling CO₂ emissions. As it proceeds to cope with such demands, the automobile industry is also initiating recycling efforts of its own. The automobile industry designated its own voluntary plans for the recycling of automobiles, specifying a material recycling rate of

55% and a 20% recycling rate for automobile components, with a final disposal rate of 25%. Automobile manufacturers are attempting to reduce the number of parts required, to ease the polyolefin grade requirement of their components, and design their products to facilitate recycling in order to meet their own voluntary plans and the standards set forth for first class specified products in the Recycling Law. In addition, chassis and engines are already designed to last longer. Furthermore, the recycling measures must be developed without violating existing policies for energy efficiency and control of CO₂ emissions.

Automobile manufacturers are proactively engaged in efforts to promote the reuse of automobile parts, consequently establishing a relatively advanced existing market for used auto parts. Technologies for the evaluation of the remaining product life of parts and the verification of part quality should eventually be developed, and it is hoped that the development of these technologies will advance recycling even further.

Prevailing Issues and the Future

As described earlier in this article, private businesses are committed to recycling and reusing products and materials, creating new trade practices and new businesses. Environmentally aware business practices as represented by recycling and reuse are being implemented under the initiatives of the private sector utilizing technologies made available by individual companies. As such, the harnessing of ingenuity and vitality of the private sector toward the attendance to environmental concerns are extremely beneficial. These efforts will support the introduction of awareness for environmental issues into the structure of the market, and are regarded as preferable approaches within the frameworks of a market economy. In particular, the Recycling Law and the voluntary plans designated by automobile manufacturers are two successful examples of the effectiveness of non-compulsory

legislative measures.

Such efforts, however, are not without limitations. In Japan, most of domestic recycling businesses are actually waste disposal companies, subject to limitations under the Waste Management and Public Cleansing Law. For instance, cement manufacturers are capable of utilizing waste materials produced by a wide array of industries such as sludge and plastics. Yet, despite the fact that the waste products are properly processed by the extreme heat of cement kilns, the industry is hindered in its recycling operations by excessively strict regulations. The steel industry also uses plastic in its blast furnaces, but is subjected to the same kinds of restrictions regarding the acceptance of waste products from other companies. Under the provisions of the Waste Disposal Law, businesses are permitted to use their own waste products, but even then, businesses are often hampered from transporting waste material between plants because individual prefectures tend to operate according to unique regulations. Recycling efforts were often disconcerted by such obstacles. There is a need to re-define the Japanese Waste Disposal Law concurrently with the development of new recycling technologies. Accordingly, full-fledged efforts to promote the development of recycling-related technologies are required. The future will probably also see a need to examine recycling objectives based on both technical and economic feasibility.

*The Eco-town Plan supports coordinated activities between local authorities and private businesses for the construction of recycling-related facilities and the provision of environment-related information, with the aims of reducing the generation of waste, promoting of recycling and the advancement of environment-related industries, and taking into account the unique characteristics of each region.

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