

# Recycling in the Market System

By Dr. Ryuhei Wakasugi

Waste disposal has become a serious problem in Japan, as in other developed countries. The general principle in Japan is that household waste is disposed by local governments, while industrial waste is disposed by companies which hire professionals to deal with this process.

Recently, however, the amount of total goods disposed has grown significantly because of increasing replacement demand for consumer durables which subsequently shortens the products' life. This has meant that the amount of household and industrial waste is exceeding disposal capacity putting the system in a state of crisis. In addition, the burden of the current waste disposal system on the environment is reaching its limits. Thus, as many have pointed out, it is vital to reduce the amount of waste through recycling rather than to increase disposal capacity. This makes recycling an important task for citizens, corporations and policymakers.

## Is the Japanese recycling rate high?

Consumers, retailers and brewers have a long established recycling system for beer bottles and standard saké bottles in which retailers offer a deposit to encourage consumer participation. A system of scrap newspaper collection for recycling has taken hold and beverage cans and bottles are being recycled. As a result, the recycling ratio in Japan is relatively high among developed countries. (Chart 1)

The recycling system, however, is currently bogged down for several reasons. First, there has been stagnation in primary product prices. Since recycled resources and primary products are in competition, lower international prices in the latter diminish prices for recycled resources, also. This makes it difficult to cover recycling costs. Second, more complicated product composition has increased technical difficulties in recycling, resulting in much higher costs.

In particular, problems are increasing in the recycling of automobiles and large

home appliances. Annual units scrapped have reached 5 million autos and over 15 million large home appliances. (Charts 2 and 3)

## Is regulation effective?

In 1991, the Japanese government promulgated a new law to promote recycling.

Chart 1  
Recycling Ratio

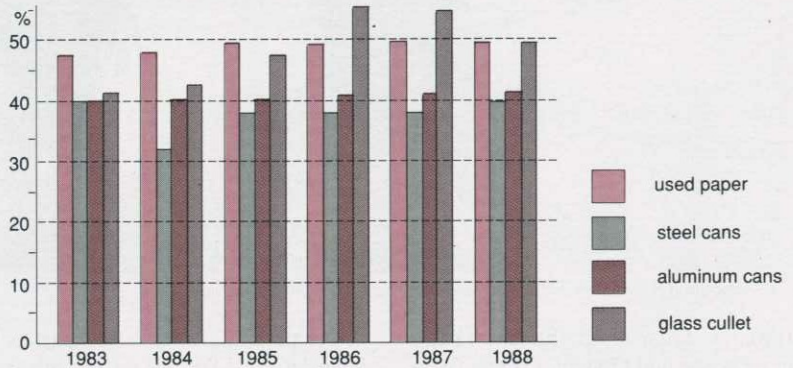


Chart 2  
Unit Scrap in Automobiles

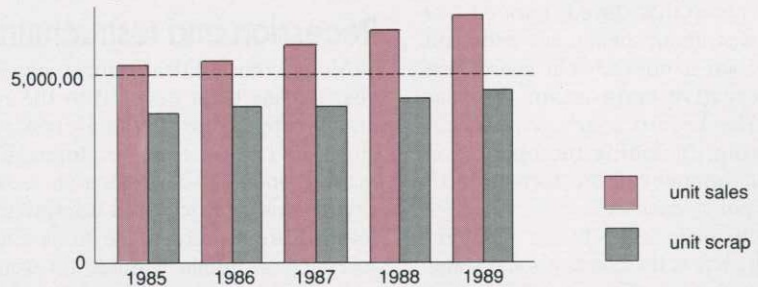
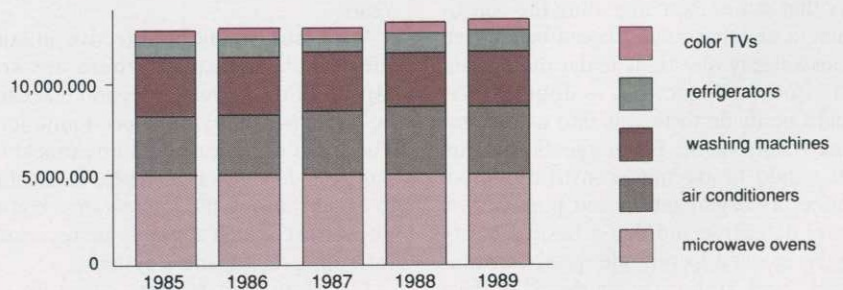


Chart 3  
Unit Scrap in Large Home Appliances



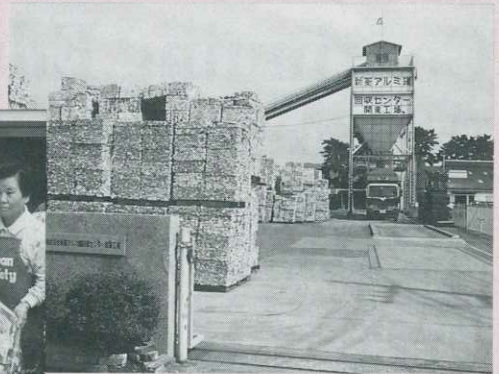


It is rare in developed countries for the central, rather than local, government to promote recycling through legislation. The law places corporations under the following obligations: (1) In paper and glass bottle manufacturing, raw materials must comprise a certain proportion of recycled resources (e.g. used paper or glass cullet). (2) Auto and home appliance manufacturers must improve product designs and material selections to facilitate easier recycling. (3) To augment consumer participation in recycling, beverage can manufacturers must put recycling signs on their products. (4) Manufacturers must standardize by-products to make them more easily recyclable.

The law has increased both public and corporate awareness of the importance of recycling, and has forced corporations to initiate recycling programs. Nevertheless, it is becoming more and more clear that the extent to which the law alone can promote recycling is limited. For example, there was a decline in the market price of scrap iron and used paper—in line with declining primary product prices—that made selective collection of usable resources out of such waste material economically unviable.

## Economic difficulties in recycling

Recycling is strongly influenced by economic conditions. Take automobiles as an example. After reusable parts like batteries are removed, scrap automobiles are crushed by a masher and divided into scrap iron and dust. Generally, the used parts and scrap iron go to market, while the dust is disposed of. If we consider a scrap automobile is a raw material, then the recycling process can be regarded as production, where additional value is created. For economic viability, the following equation must be observed:  $V = P - M > W + C$ . That is, the value added through recycling ( $V$ ) is equal to the market price of recycled resources and used parts ( $P$ ) minus the market price of the scrap automobiles ( $M$ ). This must not be less than the sum of total recycling costs, including capital spending and labor costs ( $W$ ) and dust disposal costs ( $C$ ). However, as the quality of recycled resources and used



The Japanese recycling rate is high. Aluminum cans are sent to a collection center to be recycled.

parts are generally lower than that of new ones, so are the prices. In addition, falling international primary product prices have been exerting a downward pressure on the price of scrap iron and lead extracted from batteries. Moreover, disposal costs for waste dust are increasing. Thus, even assuming the price of scrap automobiles is zero, there still is no guarantee of satisfying the market condition shown above.

## Social benefits of recycling

Corporations have taken several initiatives to address the aforementioned problems. Recyclers are rationalizing their facilities to enhance efficiency. Also, manufacturers are revising product designs to facilitate easier recycling. Compound materials are being used less so that products can be more easily reclaimed and the ratio of easily retrieved used parts like bumpers is being increased. However, this is not very productive as the process of dismantling and extracting is both labor and capital intensive. Thus some may argue that society would be better off if we allocate this labor and capital to an area of higher productivity and simply dispose of scrap autos as waste.

Such an argument, however, is misleading. If waste materials were simply all incinerated to put under the ground without any recycling, the negative environmental impact would be great and the social cost tremendous. As long as the sum of the value added by recycling and the social gains generated by reductions in waste materials exceeds recycling costs ( $W+C$ ), recycling is beneficial to society as a whole.

## A new contract system between consumers and corporations

Bearing that in mind, consider a deposit contract between automakers and consumers concluded at the time of product purchase to put disposal costs, which have not been clarified so far, into the market transactions. The contract could read: "In advance the consumer pays the cost for future disposition, and the manufacturer assumes the responsibility of recycling and disposal." Such a system implies providing subsidies to the recycling process according to the amount of waste reduced.

The subsidy should enhance recycling profitability and lower the market prices of recycled materials, which then, should recover their price competitiveness against primary products. This should eventually lead to an expansion of the recycling business. Compared to the system of the government charges on disposal, which, in turn, will be redistributed to waste disposers and recyclers, a system built into the market transaction must be far more efficient.

What is now required is to seek—beyond the argument over whether responsibility for waste material lies with corporations or consumers—a new relationship based on contracts between corporations and consumers, both of whom seek protection of the environment. ■

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