Impact of the Home Appliance Recycling Law

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1. Introduction

The new Law for Recycling Designated Home Appliances will require home appliance makers to recycle used products from April 2001. In contrast to their strengths in production and quality control technology, these makers have very little expertise in recycling. This paper looks at the potential impact of the new law on relevant industries, and at the new recycling system that will emerge.

2. The Home Appliance Recycling Law

（1）Background of Law

Every year, Japanese consumers discard approximately 1.8 million electrical products having a volume of 600,000 tons. About 80 percent of this is collected by retail stores, and the rest picked up as bulky trash by public waste disposal services. The waste is then processed either at public processing plants or by private waste disposal companies.

Waste processing involves either incineration or dumping in landfills, sometimes after crushing it. But landfill space is growing scarce, and processing costs are rising. Moreover, while incineration can reduce the volume of waste, this alternative has limited use due to concern over dioxin pollution.

Under these circumstances, the Home Appliance Recycling Law was formulated to promote the reduction of waste, effective use of recycled resources, and environmental protection.

Figure 1 Recovery and Processing Flow of Used Home Appliances

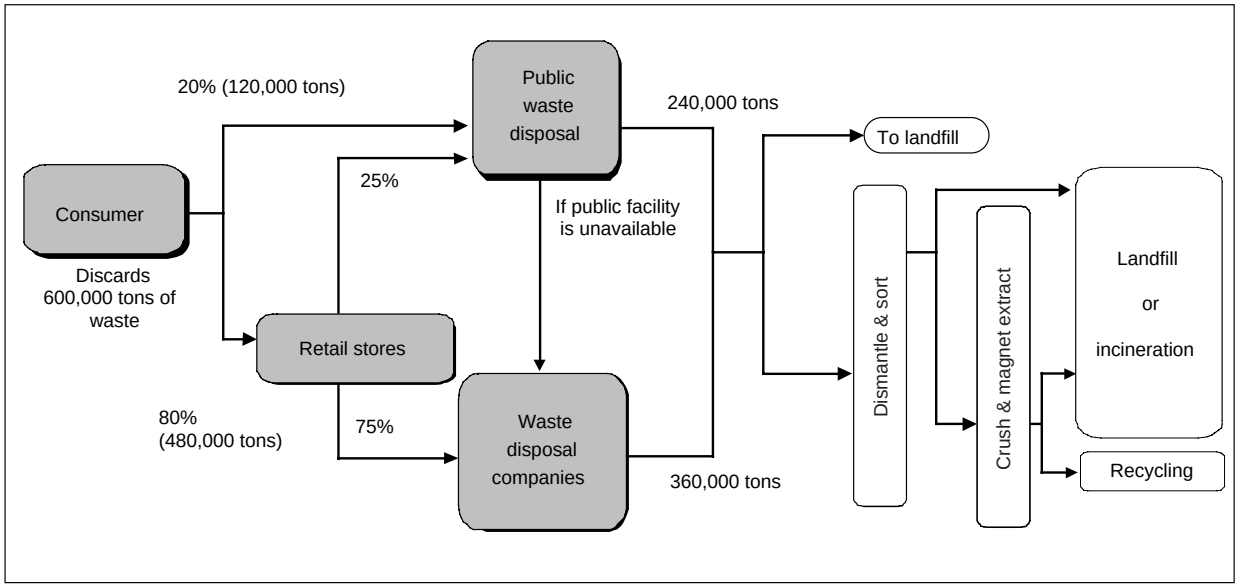


Table 1 Remaining Capacity of Final Disposal Sites for Industrial Waste (April 1, 1996)

Nationwide	209,840,000 m²	3.0 years
Tokyo metropolitan area	19,790,000 m²	1.1 years

Source: Ministry of Health and Welfare

(2) Framework of the Recycling Law

The new law clarifies the roles relating to discarded electrical appliances. Consumers shoulder recycling expenses and deliver their discarded products to retail stores. The retail store then takes the discarded products to the manufacturer, who assumes responsibility for the proper recycling of the product.

Although local governments can continue to collect and process discarded products, the law in essence makes manufacturers mainly responsible for the recycling of electrical appliances.

In case a manufacturer cannot recycle due to business failure, geographic restrictions, or other reasons, the law sets up a designated corporation system of recycling operators to assume this role. Also, to prevent illegal dumping, the law sets up a manifest system requiring manufacturers to reveal their collection channels.

Table 2 Framework of the Home Appliance Recycling Law

Enactment		April 1, 2001
Appliances covered		TVs, refrigerators, washers, air-conditioners
Definition of recycling		To extract parts and materials from appliances for use either as （1） raw materials or parts in new products, or （2） fuel.
Division of labor		
	Manufacturers	Must accept discarded appliances （whether manufactured or imported by them） Must recycle appliances （in compliance with standards for reuse of product）
	Retailers	Must accept discarded appliances （whether sold by them or traded in with new purchase） Must deliver discarded appliances to manufacturer
	Consumers	Must deliver discarded appliances, and pay fees for collection and recycling
	Local governments	Able to collect discarded appliances and deliver to manufacturers
Other		Introduction of designated corporation system Issuance of manifests Stronger supervision and penalties toward manufacturers and retailers

3. Response of the Private Sector

The new law, which requires companies in relevant industries to set up recycling programs by April 2001, is also creating new business opportunities for some companies. Below we look at the anticipated response of relevant industries, particularly with regard to the physical distribution networks and processing facilities for discarded home appliances.

（1） Retail Stores

Under the new law, retail stores will be required to accept discarded products from consumers and transfer these products to manufacturers. However, if the store accepts the products as trade-ins （by paying a minimal price）, the store is allowed to dispose of the products through waste disposal companies as before. But disposal costs should still increase due to new standards under the Waste Disposal Law that will be as tough as under the Home Appliance Recycling Law.

In areas located far from manufacturers' designated collection sites and recycling plants, existing disposal routes may prove to be less costly. For this reason, major discount stores could attempt to spur sales of new products by assuming the processing costs, and outsourcing to industrial waste disposal companies. This is one shortcoming of the new law.

Table 3 Recycling Cost to Retail Stores

	Use waste disposal company (same as before)	Deliver to manufacturer
Classification of appliances	Used appliance (trade-in)	Discarded appliance
Close to processing site		
Cost to consumer	No change	Substantially higher
Cost to retail store	Increases due to stricter disposal standards	Substantially higher costs to sort & transport (which may be charged to consumer)
Cost to economy	Increases due to stricter disposal standards	Substantially higher
Far from processing site		
Cost to consumer	No change	Increases due to stricter disposal standards
Cost to retail store	Increases due to stricter disposal standards	Substantially higher costs to sort & transport (which may be charged to consumer)
Cost to society	Increases due to stricter disposal standards	Increases due to stricter disposal standards

（2） Response of Waste Transporters

The new law will greatly affect the physical flow for recycling discarded appliances.

1. Transport to manufacturer's waste collection site

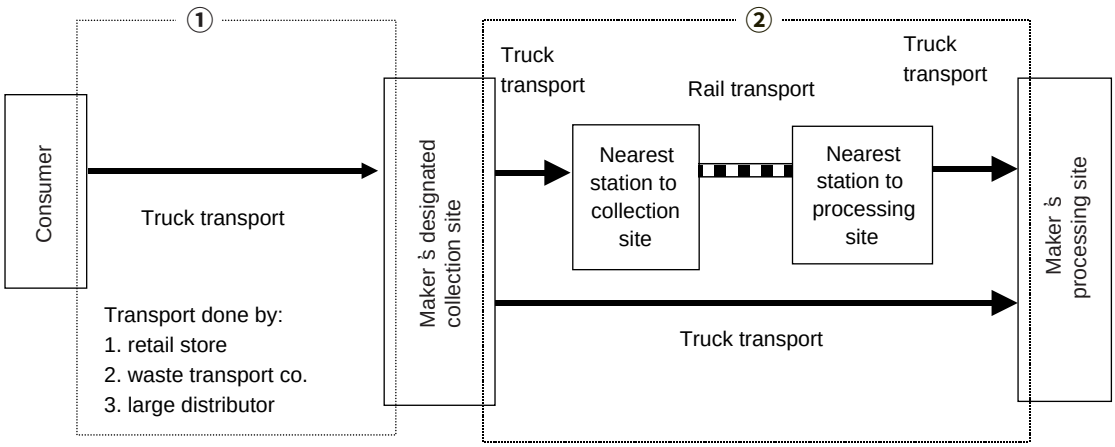
Until now, discarded appliances have moved through two main routes: from retail stores to industrial waste disposal companies, and from public collection sites to public waste processing facilities. Both routes have been have been handled mainly by operators who transport and collect the waste.

Under the new law, the main recycling route will be from retail stores to manufacturer's collection sites, and the work will be performed by retail stores（Figure 2）. However, since manufacturers will generally have only two to three sites per prefecture, distance will pose a major problem for some retail stores. Moreover, discarded products will have to be sorted according to manufacturer, and held in temporary storage space. These logistical problems will encourage smaller retail stores to outsource recycling operations.

Anticipating such demand, Nippon Express, one of Japan's biggest transport companies, is preparing to enter the recycling collection and transport business. It has already obtained licenses to collect industrial waste from 90 local governments across the country, and is encouraging manufacturers to use its warehouses as collection sites. Meanwhile, existing

waste collection and transport companies are also expected to aggressively approach retail stores. The outsourcing market for the recycling of home appliances is thus predicted to become quite competitive.

Figure 2 Physical Flow of Discarded Appliances Under the Recycling Law



2. Transport from collection to processing sites

As shown in Figure 2, some discarded appliances will travel over a newly constructed transport route from collection site to manufacturer's processing site. While some manufacturers are considering the use of physical distribution subsidiaries, others are expected to resort to outsourcing. Outsourcers who are large distributors with nationwide networks already in place will have the competitive edge in this market.

Another viable alternative is rail transport. Already in use in Kawasaki City and Saitama-ken, rail transport enjoys many advantages including low pollution and low cost. Japan Environment Railway Transport, a venture business formed in 1994, is building a national rail freight network for industrial waste with one member company in each of 133 districts nationwide. Rail transport could become the primary mode of long distance waste transport.

Of the transport alternatives available for discarded appliances, manufacturers will choose the most efficient transport system for their plant locations.

（3）Response of Home Appliance Makers

When the Recycling Law takes effect in 2001, few manufacturers will be prepared with proprietary recycling facilities and networks across the nation.

Instead, processing sites will assume a variety of operating modes as shown in Table 4. In addition, manufacturers still have decisions to make such as whether to dismantle manually or to mechanize the process.

At the present stage, progress is being held back by some key unresolved issues such as how to calculate recycling rates and how to deal with harmful substances such as freon. Preparations are thus running behind and problems are expected to arise in the early stages. In time, however, manufacturers will iron out these problems and optimize their operations according to scale and location.

Table 4 Predicted Operating Modes of Recycling Sites

Operating mode	Characteristics & examples
Solo operation	Plant operating capacity can be maintained by large makers if near major metropolitan markets.
Joint operation	Smaller makers can maintain plant operating capacity by operating a plant jointly with other makers.
Joint operation with waste disposal co.	Inexpensive yet high recycling capacity is possible by relying on knowhow of waste disposal company. Expected to become most common mode. Mitsubishi Electric has set up Hyper Cycle Systems with major disposal company Ichikawa Engineering
Eco Town Program	Makers can receive a 50% subsidy for building a recycling facility in an Eco Town. Also, construction permits are easier to obtain. Kita Kyushu City is the frontrunner, but Odate-shi in Akita-ken and Uguisuzawa-machi in Miyagi-ken have plans to build processing plants in idle mining facilities. More developments are expected.
Outsourcing	Uses an existing disposal company as designated corporation. May be the only alternative in less populated areas and among smaller makers.

4. Response of Local Authorities － Key to Law's Success

Municipalities hold the key to the success of the recycling law. While not directly affected by the law, whether and how they choose to continue processing discarded appliances after the recycling law takes effect could affect the overall recycling system in significant ways.

Continuing to provide public disposal services would result in lower recycling fees for the public. But if public services process a significant share of discarded appliances, operating rates of manufacturers' plants would fall, thereby possibly undermining the intention of the recycling law to make manufacturers primarily responsible for recycling.

However, since public processing services would be required to meet standards as stringent as in the recycling law—which they are not currently equipped to do—new capital investment would become necessary. Considering that most municipalities are now financially incapable of making such outlays, few public waste disposal services are expected to continue processing discarded appliances.

On the other hand, since the recycling law does not require public waste disposal services to process discarded appliances, some municipalities are expected to take this opportunity to completely withdraw from the handling of discarded appliances. However, if local governments pull out of the collection and transport of discarded appliances, a new collection network will have to be built from scratch, thereby drastically increasing the financial burden on the public. This could cause rampant illegal discarding and cost the municipalities even more to clean up.

Based on the above considerations, the most desirable role of municipalities would be to engage in collection and transport, but not in the recycling process itself.

Even then, their workload would not decrease significantly because of new responsibilities such as sorting discarded appliances by manufacturer, collecting recycling fees from consumers, and transferring the money to manufacturers.

In addition, the cooperation of local authorities is also indispensable to the success of the recycling law in areas such as providing collection sites to manufacturers and expediting construction permits for recycling plants.

Table 5 Costs and Benefits of Public Waste Disposal Alternatives

Alternative	Applicable law	Benefits	Costs
1. Continue to perform waste disposal	Waste Disposal Law	Do not need to sort discarded appliances by maker. Existing collection system minimizes setup cost.	Need added capital investment to comply with new disposal standards. May hurt operating capacity of makers' plants, and thereby undermine intent of appliance recycling law.
2. Do not collect, transport, or recycle	Home Appliance Recycling Law	No added capital investment or Costs to local govt.	May greatly increase cost borne by local residents. Illegal disposal may become rampant.
3. Collect & transport, but not recycle	Home Appliance Recycling Law	Local govt. need not make further capital investment to comply with new standards. Existing collection system minimizes setup cost. Able to boost operating capacity of makers' plants.	Added costs such as cost of sorting discarded appliances by maker.

5. Issues and Prospects

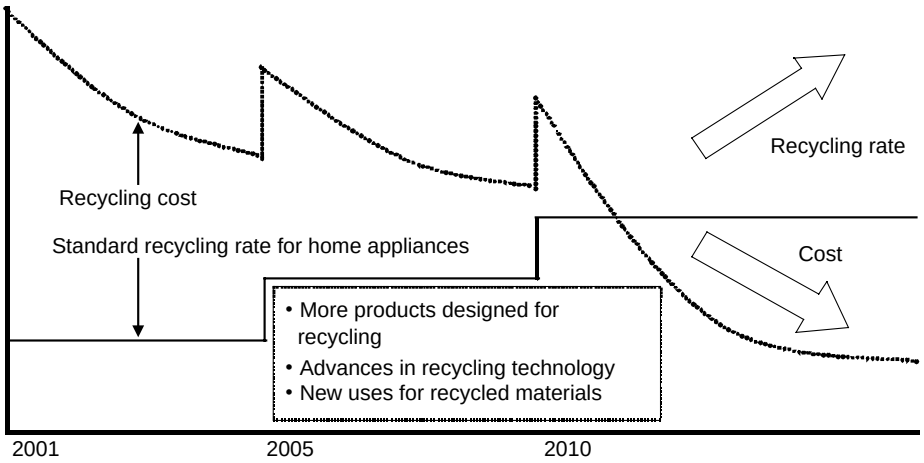
As discussed earlier, the Recycling Law leaves many unresolved problems including: (1) the continued existence of industrial waste disposal services rests on the decision of retail stores, and (2) the varied plans of local authorities for public waste disposal services hold back manufacturers from deciding how much processing capacity to build and where to build it.

In addition, the recession has dampened demand and caused scrap material prices to drop, leaving iron scrap recyclers and other materials recyclers in a very poor business environment. Thus even if the recycling process is carried out at great expense, the recycling system could break down if there is no demand for recycled resources.

However, there is no question that the recycling system will produce significant effects once it gains momentum. Significant advances are anticipated in recycling rates and cost reductions from the following: (1) manufacturers have begun designing products for recycling, and in time more and more products will be designed for recycling; (2) as recycling technology improves, labor costs of processing systems will decline; (3) the recent Container Packaging Recycling Law has already spurred greater research and development in recycling uses for discarded plastics, and eventually plastics will become recyclable too.

As available landfill space decreases from year to year, failure of the Appliance Recycling Law to achieve its intended objective could have disastrous consequences. It is thus critical that experts in all relevant industries combine their knowledge in building a viable recycling system for home appliances.

Figure 3 Outlook for Recycling Standards of Discarded Appliances and Processing Costs



	2001	Added in 2010
Freon collection	Coolant only	Coolant and insulation
Recycled materials	Iron, aluminum, copper, Braun tube	Plastic
Recycled appliances	TV, air-conditioner, washer, refrigerator	Personal computer, microwave, etc.