

Japan's Recycling: More Efficient than U.S.A

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Abstract

Recycling plays a major role in global society. Waste is a big issue and countries are struggling with ways to keep the situation under control. Japan is a model country in terms of recycling. Their efforts have surpassed many countries. Japan has recently passed a number of laws that have helped the country's recycling issues. These laws have produced tremendous results in Japan's favor. Through enforcement of these laws the country sends only 16% of its solid waste to landfills. The United States sends close to 70% to landfills. Consumer recycling in Japan is much more advanced than the United States. Waste is separated into categories to maximize the recycling process and to minimize waste sent to landfills. The U.S. should be modeling their recycling efforts toward the Japan recycling model.

Introduction

As the World's population continues to grow at a dramatic pace, consumers are producing more waste. According to the Environmental Protection Agency (EPA), the average U.S. citizen produced 4.4 pounds of waste per day during 2000. This is the equivalent of over 1,600 pounds of trash per year per person or more than 220 tons of waste being generated each year (Onorato, 2001).

There are many sources of trash including bottles, boxes, cans, yard trimmings, grass clippings, furniture, clothing, newspapers, and much more. Americans also dispose of several million tons of tires, appliances, furniture, paper, clothing, and other durable and non-durable goods each year. Packaging waste, including glass, aluminum, plastics, metals, paper, and paperboard also contributes significantly to annual waste totals. Even yard trimmings, such as grass clippings and tree limbs, are a substantial part of what is thrown away.

An estimate of the type and percentage of waste products can be seen in Figure 1. With an abundance of waste being produced by a growing population this is where recycling comes into play.

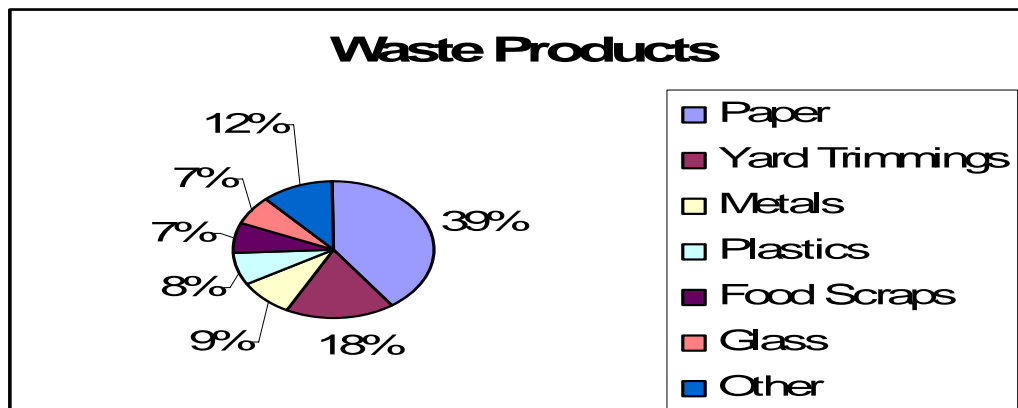


Figure 1. Percentage of waste products reported by the EPA

Recycling plays a major role in today's global society. Over the past twenty years, concern about the environment has brought with it a massive increase in recycling. In Japan, recycling rates are much higher than those of the United States: Approximately 50% of solid wastes are recycled in Japan, compared to about 30% in the United States (EconEdLink, n.d.). The table below represents recycling activities in eleven different countries. The countries were rated on a scale of one to eleven in a number of different categories. The lowest number total is desired.

Consumer Recycling is more refined in Japan

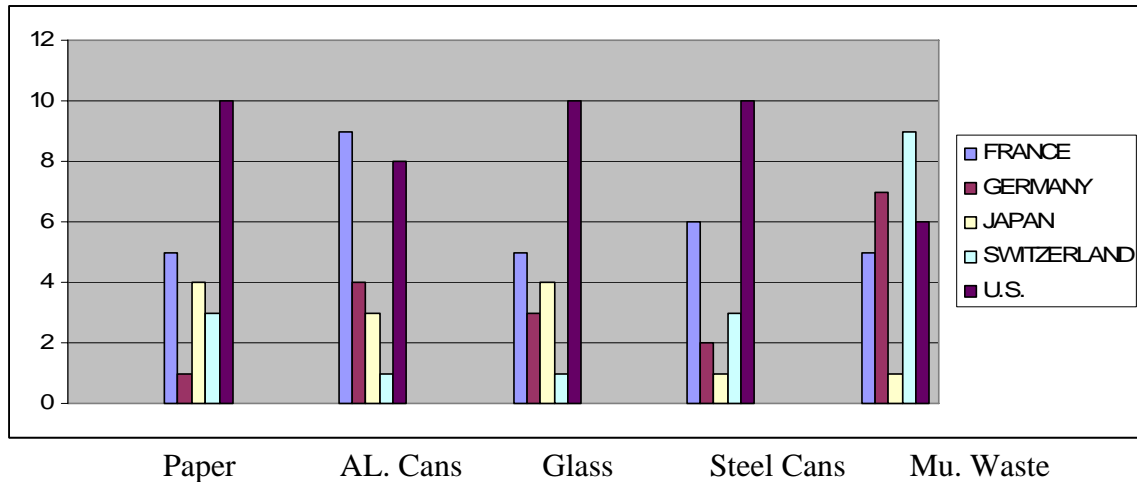
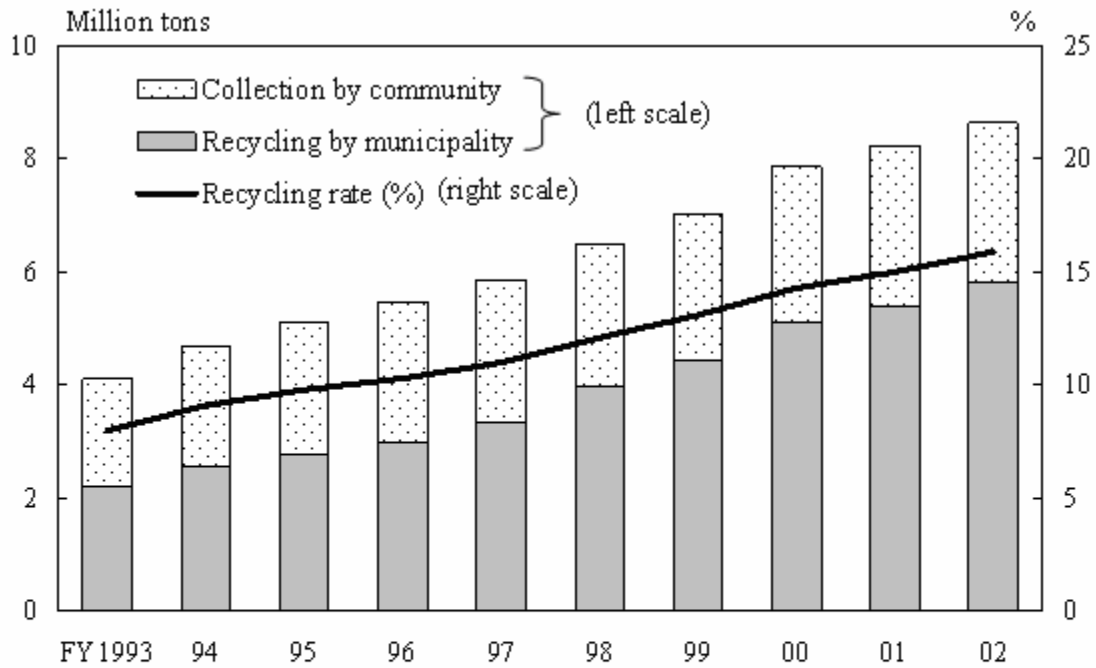


Figure 2. Comparison of Japan to other countries' recycling materials (Kim, 2004)

According to Figure 2, Japan is the most efficient in terms of recycling. Japanese trash pickup is handled very differently than in the U.S. Instead of once a week, it is picked up almost daily. There are three main types of garbage which must be separated completely from each other: burnable, non-burnable, and recyclables. Non burnable includes pieces of metal or glass, china, rubber, Styrofoam and plastic packages or wrappings, plastic 'pet' bottles, shampoo bottles, and the like. Burnable includes regular household trash such as paper, diapers, clothes, wood, food waste, and so on. Food waste should preferably be put in a plastic bag (such as those from convenience stores or supermarkets) and tied up before being thrown away. The plastic bag keeps the smell of the garbage from attracting flies or scavenging animals such as crows or stray cats, which rip open bags in search for food. Recyclables include cans and bottles; these should be rinsed out before being placed in the garbage, again to avoid attracting pests. Residents are responsible for sorting their waste and for peeling off labels from bottles and containers. Trash is left out in clear plastic bags, not trash cans. The bags must be clear, or semi-transparent; to assure that the trash is of the right type for that day's pickup. People do not leave the trash out in front of their own residence, but rather at one of several trash pickup points available on every block (Onorato, 2001).

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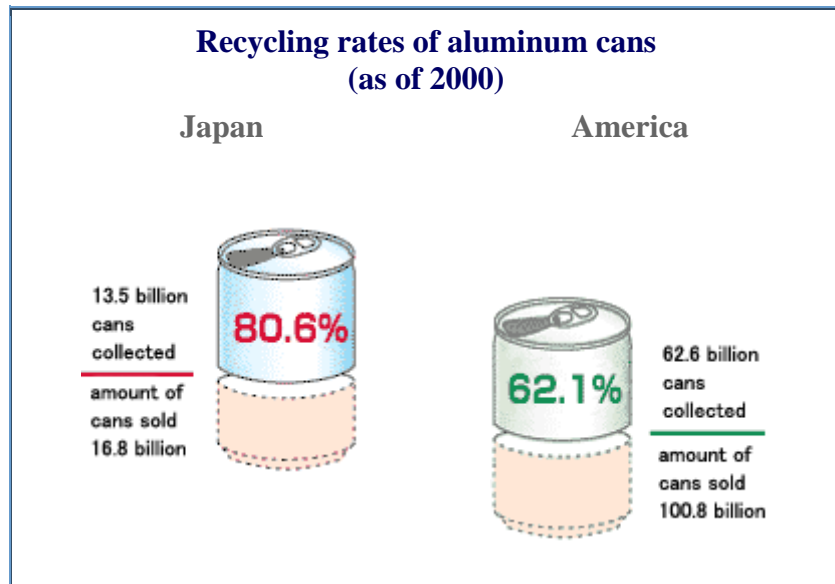


$$\text{Recycling rate (\%)} = \frac{\text{Total amount of material recycled}}{\text{Total amount of processed waste} + \text{Amount of collection by community}} \times 100$$

$$\text{Total amount of material recycled} = \text{Amount of recycling by municipality} + \text{Amount of collection by community}$$

Figure 3. Recycling of Residential Waste (Ministry of the Environment, 2002)

Figure 3 represents Japan's recycling rate over a nine year period. Within nine years the percentage quadrupled. The new recycling laws play a dramatic role in the increase.



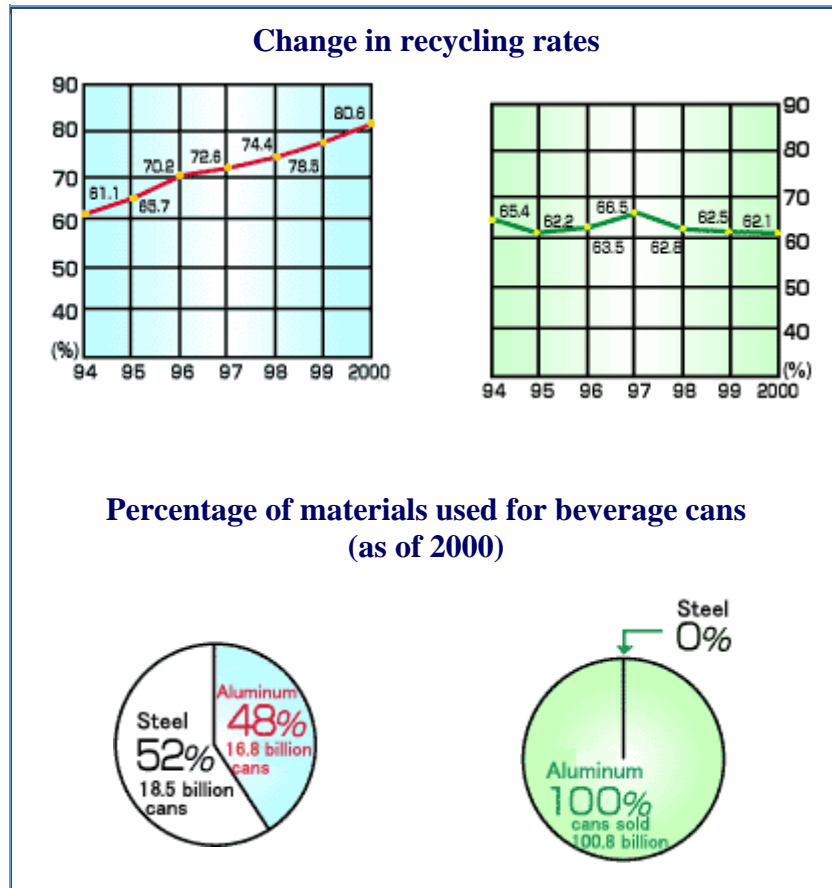


Figure 4. Recycling rates of aluminum cans (for beverages) in Japan and the USA as of 2000 (Isao, 2002)

Figure 4 represents materials used for beverage cans in the United States and Japan. The Japanese recycle 100% of beverage cans, while the United States recycles about 48% (Isao,2002). If the United States switched all beverage cans to Aluminum that would save a substantial amount of waste that would be diverted into the landfills.

Laws and Regulations Enforcing Recycling

The Japanese are very efficient in recycling. There are strict laws in place and the people have a great sense of stewardship for the land. One such law is Japan's Home Appliance Recycling Law, which came into effect in April 2001. The law covers four major types of home appliances: televisions, refrigerators, washing machines and air conditioners. The law is intended to promote the recycling of useful parts and reduces the amount of unwanted household appliances in local landfills (Sony, n.d.).

In accordance with the law:

- Consumers pay a recycling fee when disposing of home appliances
- Retailers take back discarded appliances and pass them on to manufacturers
- Manufacturers recycle discarded appliances thus retrieved

The issue, in this case, is who bears the cost of recycling (Onorato, 2001). When producers are "billed first" for the cost of recycling, the incentives encourage them to make an investment in plant and equipment, enabling them to build appliances that are easier to recycle. Costs of production increase and the supply curve for this industry shifts upward and to the left.

On the other hand, when consumers are billed first, the incentives encourage consumers to purchase durable goods less frequently and to rely less frequently on illegal dumping aimed at avoidance of the disposal fee. The demand curve for appliances then shifts downward and to the left. In either case, the result is fewer new appliances sold and fewer appliances dumped in landfills. Sony has established a nationwide cooperative recycling network with five other manufacturers. Consequently, Sony-manufactured televisions are now recycled at 15 recycling plants across Japan. Sony is the principal shareholder of one of the 15 plants: Green Cycle Corporation in Aichi Prefecture. In fiscal 2004, approximately 570,000 Sony-manufactured televisions were recycled (Sony, n.d.).

The Home Appliance Recycling Law requires the recycling of at least 55% of televisions. Sony has consistently achieved this requirement since fiscal 2001. In fiscal 2004, the recycling rate for Sony-manufactured televisions was 86% (Sony, n.d.). The Recycling Research Center (established by Sony in October 1997) and Green Cycle, cooperate to conduct research on the state of recycling in Japan. Feedback from such research helps television designers and engineers create new products that are easier to recycle.

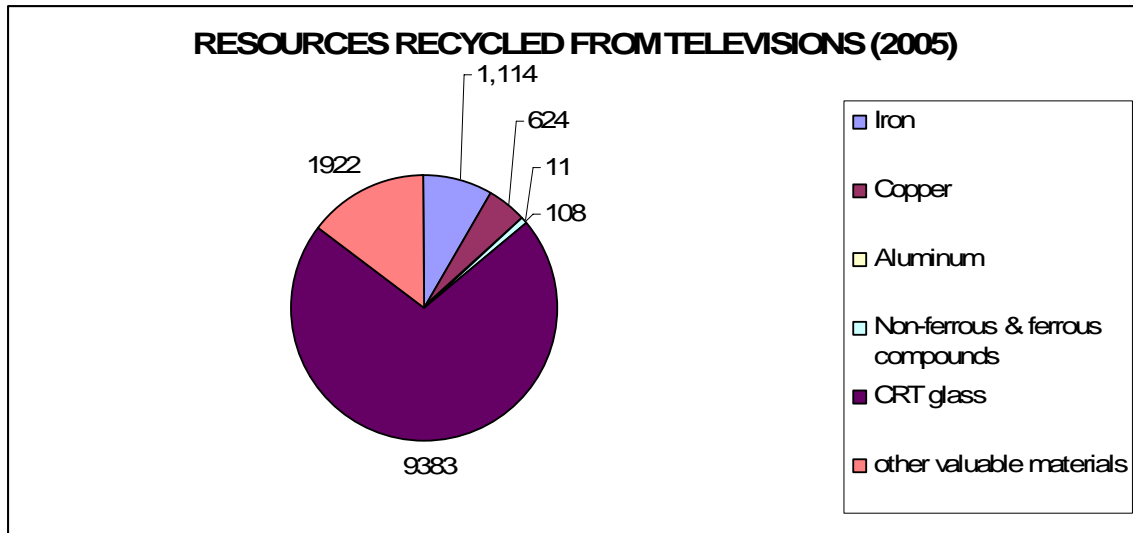


Figure 5. Numbers are in tons (Plastic Waste Management Institute, 2006).

Television Recycling in Japan

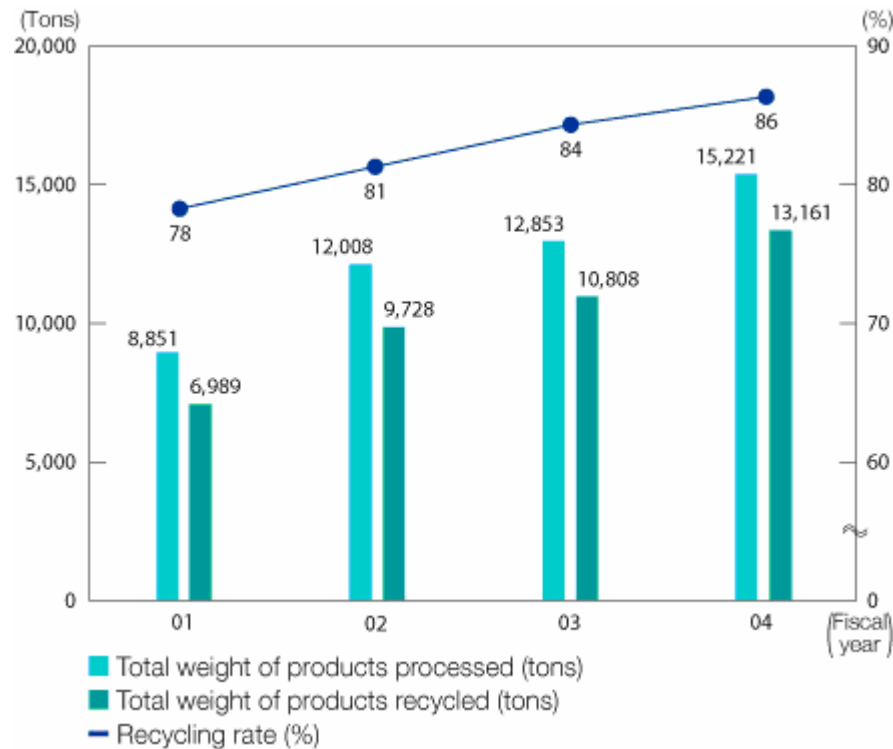


Figure 6. Represents different materials and televisions recycled in Japan (The Japan Containers and Packaging Recycling Association).

A second law that went into effect in Japan is the Automobile Recycling Law of 2005. Japanese auto makers face more competition to produce eco-friendly cars, requiring manufacturers to charge drivers for the recycling of their vehicles. Car owners are to pay about 7,000 to 18,000 yen (\$65 to \$166) per disposed vehicle, according to the government's latest estimates, to cover the recycling of chlorofluorocarbons (CFCs), a harmful gas used in air conditioners, airbags and automobile shredder residue (ASR) (Kim, 2004).

The law is part of the government's solution to meet the rising cost of disposing of car-related scrap as landfill sites become scarce. Japan is also aiming to raise the recycling rate for cars to 95 percent by 2015, from around 80 percent now (Kim, 2004). Because the fees would differ from model to model depending largely on the amount of waste produced, carmakers are under pressure to come up with ways to keep them down, thereby attracting cost-conscious customers. Toru Tohata, general manager of Nissan Motor Co. recycling promotion department said "we would try to bring down the fee by coming up with the best materials to use for various parts at the design stage, as well as by developing ways to incinerate ASR and reuse the energy produced" (Kim, 2004, ¶ 4).

In Japan, the volume of municipal solid waste discharged has increased. The volume of containers and packaging has become approximately 60% of the total municipal solid waste. As a result, a third law that was enacted: The Container and Packaging Recycling law. This law reduces the waste of glass containers, PET bottles containing drink or soy sauce and paper cartons (except for those cartons applying aluminum foil inside). The law promotes efficient use

of recycled containers and packages generated and reduction of waste by shifting those wastes into recyclable resources (The Japan Containers and Packaging Recycling Association, n.d.).

Japan Saves Space with fewer Landfills

Wastes that cannot be recycled or incinerated are sent to landfills. A secure landfill is a carefully engineered depression in the ground (or built on top of the ground, resembling a football stadium) where wastes are put. The aim is to avoid any hydraulic [water-related] contact between the wastes and the surrounding environment, particularly groundwater. There are four critical elements in a secure landfill; a bottom liner, a leachate collection system, a cover, and the natural landscape setting. The landscape setting can be selected to minimize the possibility of wastes escaping to groundwater beneath a landfill. The three other elements must be engineered. Each of these elements is critical to success.

Conclusion

Recycling plays a major role in today's global society and Japan's recycling is leading the nation. The country has passed rigid laws to control the waste issue in their country. On the consumer level, Japan's citizens follow very strict recycling guidelines at home. Waste is picked up on a daily basis and trash is separated and most of it is recycled.

Landfill use is at a bare minimum in Japan. The country has a small landmass, with a big population. They have to be very careful in what goes into the landfill. Only 16% of waste is sent to the landfill in Japan versus 70% in the United States. The United States needs to pass rigid laws and model their recycling efforts after Japan. As time goes on, the waste issue will get worse and it is just a matter of time until this issue is going to present a very big problem for the United States. Hopefully the United States can someday be on the same level as Japan in the recycling arena.

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