
Plastic waste management in Japan

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Abstract

Since its establishment, PWMI has been advocating the voluntary and collaborative efforts among industries, citizens and municipalities. Nowadays 78% of plastic waste are used as resources effectively again. It can be said that plastic waste was considered to be useful resources rather than worthless garbage. The dramatic change moving from a throwaway society to a recycling-style economy may be attributed to several factors, i.e. legal system, technology development and public education and so on. On these factors, several examples and topics are described on this article.

Keywords: Consumers conscience, Business morality, Government policy

Abstract

1. Plastic waste flow in Japan

In Japan approximately 10 million tons of waste plastic is discharged every year. In 2011, plastic production volume was 11.6 million tons, and 9.9 million tons were consumed. Then 9.5 million tons of waste plastic were discharged, from pre-consumer and post-consumer sources.

And 78% of the total discharged plastic waste was recovered, 26% of "material-recovery" and 52% of "energy-recovery". The utilization rate has been continuing to rise every year. It was below 50% before 2001. In recent years, it is rising to near 80%.

Analyzing the differences of the recovery and recycling method between industrial waste and domestic waste, it is clear that in case of municipal plastic waste, portion of material recovery is smaller than the case of industrial waste. It is because of the fact that from household waste, it is often difficult to collect a single material separately.

Analyzing mechanically recycled post-consumer plastic according to discharged sources it can be said that when a collection system suitable for the type of plastic and suitable for the sources is established, we can use the post-consumer waste plastic for mechanical recycling properly.

2. Case studies on voluntary collection

(1) PET bottle

The flow chart analysis of PET bottle compiled by the council of PET bottle recycling shows that around 62% of PET bottles are collected by municipalities. 38% are collected by voluntary basis. From municipalities, around 65% of collected bottles are recycled through designated body route. 35% are recycled through independent route.

In late years over 95% of municipalities have sorted collection systems of PET bottles. In addition, voluntary collection ratio remains high level, between 30% and 40%. By the combination of these collection routes and recycling route, the collection rate of PET bottles in Japan is very higher than in other countries.

(2) PSP food tray

In case of the recovery of the PSP food tray, the role of the voluntary efforts of businesses plays a larger role than the role of municipalities' collection.

(3) Agriculture plastic

Under the Japanese legal system, industries have responsibility to manage plastic waste from industrial sites. It is not municipalities' responsibility. There are examples of collaborative efforts of industries to collect post-use plastic, which enables high quality recovery of plastic. The recovery rate of post-use agricultural plastic has been increasing very rapidly. In 1999, PVC agricultural film industry has worked with organizations of farmers, and built a recycling system in each province. Since 2007, the system covers throughout the agricultural film, including PO film..

(4) PVC pipes and fittings

The growth of recovery rate of PVC pipes and fittings can be attributed another system .

PVC Pipe Fittings Association, in cooperation with recycling companies and constructors, created a system of collection and recycling in 1998. Currently, the number of collection sites amounts to 86 locations across the country.

The recycling system also is promoting the reuse of recycled PVC.

(5) EPS

The majority of EPS ends its life as containers and cushioning materials after use at wholesale markets,

supermarkets, department stores, electrical retailers and other stores.

To facilitate recycling efforts by these waste dischargers, Japan EPS Association, JEPSA, works to help them develop recycling system, and is also directly involved in recycling activities through the "EPSY Plaza" operated by its members.

3 Discussion

As is stipulated in the basic provisions of the Japanese basic law for establishing a 3R (Reduce, Reuse and Recycling) oriented and sustainable society, it is important that every industries and citizens act proactively and voluntarily, while sharing roles based on technological and economic potential. "Consumers conscience", "business morality" and "government policy" are important factor for realising this concept.

(1) Consumers' conscience.

For Japanese people, the garbage sorting has become their lifestyle.

Why does the Japanese citizen work on garbage classification proactively?

The reason is not penal provisions of laws. Rather it seems the attitude stems from conscience of citizens.

The result of a governmental public opinion survey pertaining to contribution to society shows that year by year, citizens become eager to contribute to society more and more. The environmental conservation activity is one of the top activities as such kind of the contribution. Another governmental public opinion survey shows that more than two third of citizens answer that "garbage separation" and "empty bottles cleaning" are their daily behavior. Nearly half of citizens think that cooperation with the store collection of recyclables is a matter of daily behavior.

(2) Voluntary initiative by industries

As mentioned above, voluntary collection plays an important role in collection of the recyclable garbage from the home as I mentioned before.

In addition, the voluntary design guidelines for designated PET bottles is noteworthy.

These are other aspects of voluntary efforts by businesses, for the purpose of ensuring high quality recycling.

(3). Municipalities' policy.

There are approximately 1700 municipalities in Japan. These municipalities take a role to process daily households garbage for the purpose to keep the hygiene of residents. The municipality is also active to separate collection. More than 95% does the separation of PET bottles, approximately 60% are working for plastic containers and packaging..

"Energy-recovery" without segregation is also an effective option for municipalities. There are 1211 municipal garbage incineration facilities in Japan. Among them, 791 facilities have energy recovery capacity, and 314 facilities have electric generation capacity.

However, many of facilities have only small and inefficient generation capacity. So the switch to high efficiency system (at least more than 10% of generation efficiency) becomes the urgent business.

4 Conclusions

Nowadays 78% of plastic waste is used as resources effectively in Japan. It can be said that plastic waste was considered to be useful resources rather than worthless garbage. The dramatic change moving from a throwaway society to a recycling-style economy may be attributed to several factors, i.e. legal system, technology development and public education and so on.

Although measures for collection and recovery differ from products to products, it is noteworthy that "consumers' conscience", "business morality" and "policy of municipal government" play important roles among other factors for enhancing recovery rate of plastic waste.