

Composition of Household Wastes in Japan and Proportion of Plastics

What are the contents of household (or municipal) wastes?

A wide variety of wastes are generated out of our daily life. They are garbage, paper, cans and bottles, plastics and textiles, etc.

This Institute conducts surveys on the waste composition of such household wastes. According to the recent survey conducted in Nishinomiya City, the waste composition was 37% paper, 33% garbage, and 12% plastics.

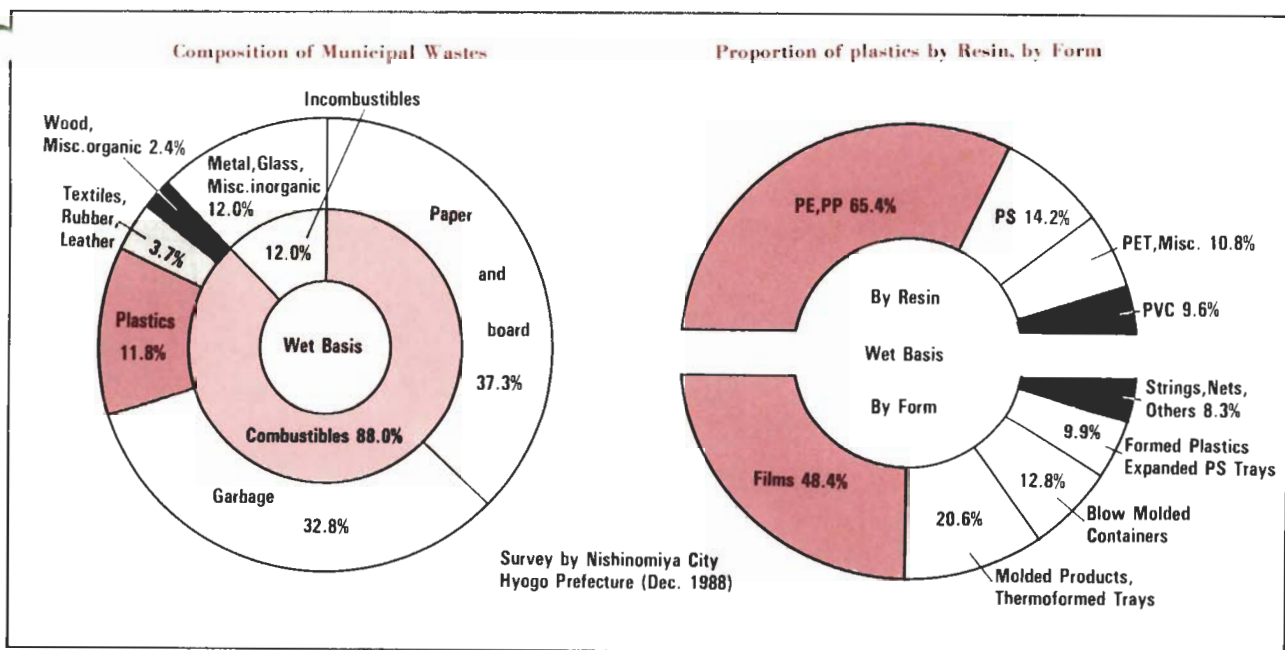
For your information, Nishinomiya City is located between Osaka and Kobe, two big cities in the western part of Japan, and it is a bedroom suburb and industrial city where a number of leading Japanese "sake" (wine) breweries are located. The population is 420,000. The municipal solid wastes collected amount to about 100,000 tons per year. As the city is actively promoting resource recovery of metals, glass bottles by separate collection, the proportion

of metal and glass in the wastes collected to disposal facilities is smaller as compared with other cities.

What are the contents of waste plastics?

The proportion of plastics in the municipal solid wastes was 11.8% (by weight on the wet basis), but since about 30% moisture, dirt and foreign substance stick to the plastics in municipal solid wastes, the proportion becomes 8~9% (on the dry/wet basis) when they are eliminated.

By resin, polyolefin resins accounted for the largest share, 65.4%. By type, films accounted for approximately 50%, which means that those used as containers and packaging materials are exceedingly large. In Nishinomiya City the household combustible wastes including such waste plastics are incinerated. The proportion of the waste plastics in the municipal solid wastes as introduced here can be regarded as a representative example of the urban areas in Japan.



Present Status of Plastic Recycling in Japan

Disposal of household waste plastics by incineration and landfill

In Japan, waste plastics, such as plastic containers, packaging materials, etc. generated from households, are collected and disposed of by municipalities concerned (cities, towns and villages) together with other household wastes.

The methods to dispose of these waste plastics are mainly incineration and landfill. About half of the municipalities are disposing of them by incineration, and the remaining half of the municipalities want to manage these waste plastics by separate collection and landfill. However, only 40~50% of waste plastics are separated and landfilled, and the remainings are incinerated. There are almost no municipalities realizing plastic recycle.

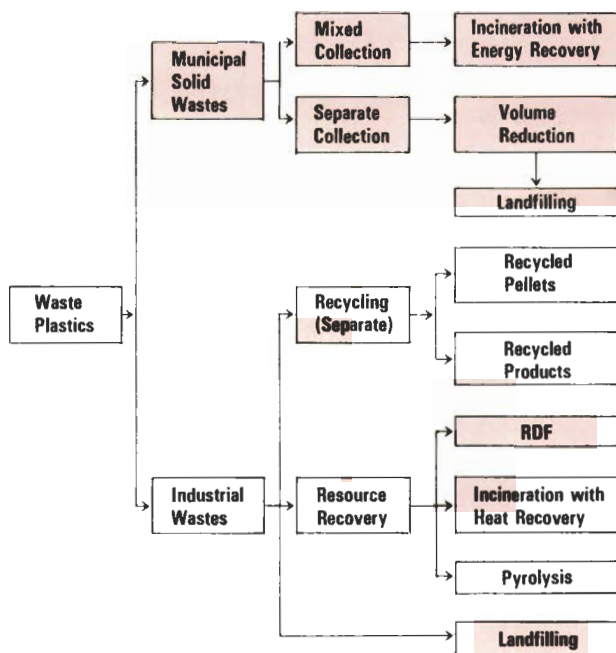
The only one municipality practicing the recycle utilization of the household waste plastics is Kusatsu City in Shiga Prefecture. Examples of the recycle utilization of the waste plastics in the household wastes, including this example of Kusatsu City, will be introduced in and after the next issue.

Industrial and commercial waste plastics partly realizing recycle utilization

In the meantime, waste plastics generated from various manufacturers and distribution stage are disposed of by generating business operators respectively, who are responsible for the disposal as industrial and commercial wastes in accordance with the Waste Disposal and Public Cleansing Law.

Industrial waste plastics, such as used plastics, scraps, off-grade products and others generated from

Conceptual Model of Plastic Disposal and Resource Recovery

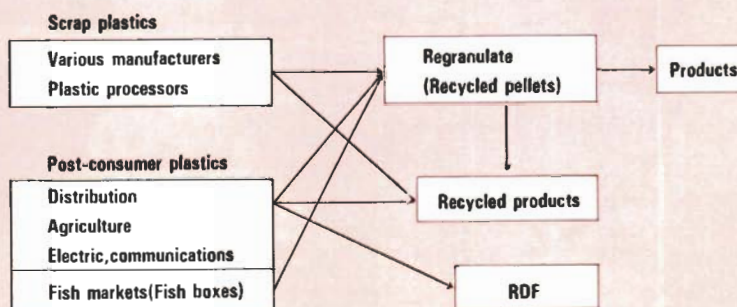


business operators are suitable for recycle utilization from the viewpoint of a higher collection efficiency as they have less inclusion of foreign matter and contamination, component resins are clearly identified, sorting by resin is easy, they are available in large quantities.

Two methods of plastic recycling

There are two methods to recycle the industrial waste plastics: (a) repelletization to produce recycled pellets (secondary materials of plastics) from homogeneous waste plastics, and (b) to directly produce recycled prod-

The flow of the recycling for the industrial waste plastics





Press molding machine



Artificial ladders and plates used in parks

ucts mainly from post-consumer plastics as materials.

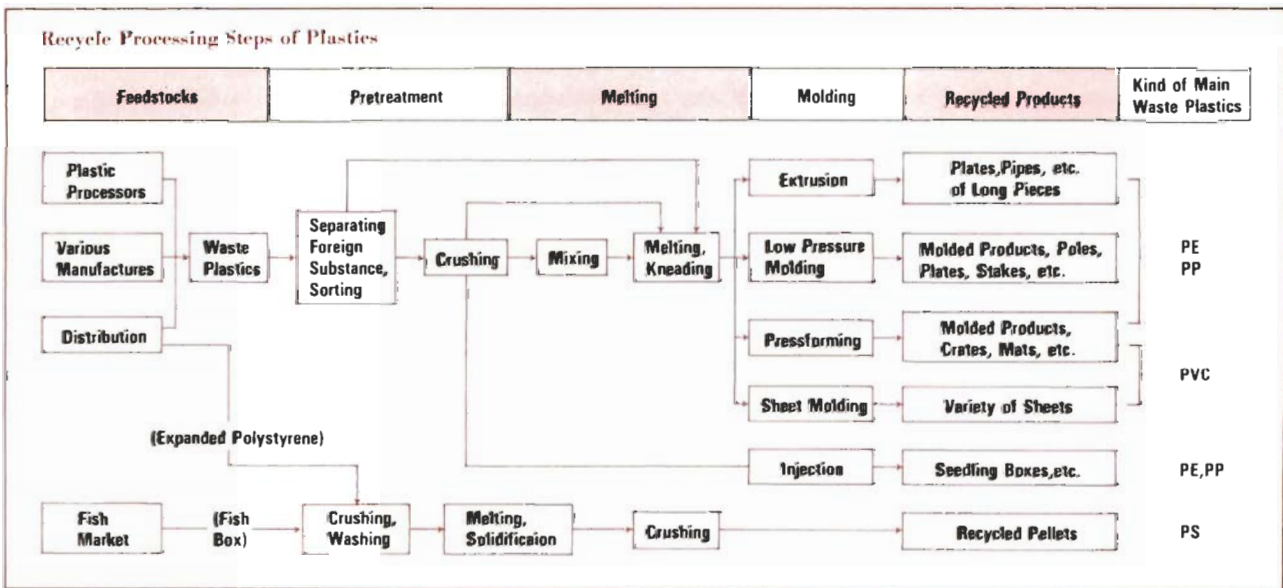
Shown front page below is the major generating industrial sectors and the flow of the recycling for the industrial waste plastics.

The recycled pellets manufacturers operating in Japan are between 200~300, and their output is estimated between 600,000~700,000 tons per year. These recycled pellets are utilized as low price substitute for virgin feedstocks and feedstocks for sundry products. Meanwhile, the manufacturers directly producing recycled products are about 100, and their output is estimated about 100,000 tons per year.

Methods of plastic recycling

The flow producing the recycled pellets is as follows:
 Feedstocks→Separation by resin→Removal of foreign matter →Crushing →Coloring, stabilizing agents and fillers→Melting, repelletization→Various products

Meanwhile, the processing method to directly produce recycled products is carried out as follows according to the resin of the feedstocks and the type of the recycled products.





Arrangements for Municipal Waste Disposal Research System in Japan

The disposal of the wastes generated out of our daily life is becoming a big problem recently in view of our enhanced social needs for a comfortable living environment as well as expansion and diversification of our consuming activities.

The research and development activities to support progress of the general waste disposal operations have so far been carried out by introducing technologies and systems existed in other fields, such as manufacturing know-how, etc., into the waste disposal field and implementing them in the form of improvement within the government offices, municipalities, private companies and universities individually. Further, such research and development have been implemented to meet the requirements on each occasion.

However, the role to be performed by the general waste disposal operations as an infrastructure that is indispensable to securing a clear, comfortable living environment will increase more and more in the future, and the operations are expected to be further actively developed on a long-term, all-embracing view for the future. It is, therefore, necessary to promote the research and development activities related to developing proper technologies in the waste disposal field systematically and promptly, further introducing diversified, high technologies.

Under the circumstances, discussions had been put forward between the parties concerned in order to establish a new juridical foundation in which all parties concerned from the government

offices, municipalities, private companies, universities and so on may participate and which becomes a core for promoting the research and development activities in the future and performs the role for coordination, and as a result Waste Research Foundation (chairman Professor Emeritus Masao Sago, Tokyo Metropolitan University) was established and inaugurated on August 1, 1989.



An outline of the operations of Waste Research Foundation

The operations of Waste Research Foundation are diversified with planning, designing and related promoting activities of the themes for research and development, promotion of the technologies in the private sectors, countermeasures for the wastes having difficulties for proper disposal.

For example, projected are the waste disposal operations in the water-front development programs and deep-underground development projects, the waste underground transport pipeline operations, the promotion of countermeasures for non-regulated hazardous substances, such as dioxin, the application of AI (artificial intelligence) to the waste disposal management, the examination of the methods for evaluation of waste disposal difficulty and the support activities for the self-evaluations by business operators, and development of data bank, information providing, and international interchange activities, etc.

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